

| Basic data      | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                    | Albedo varieg.  | Reference code |
|-----------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|--------------------|-----------------|----------------|
|                 | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c                |                 |                |
| <b>1 Ceres</b>  |   |           |             |           |             |           |             |           |                           |                   |                    |                 |                |
| I               | Prograde rotation   |           |             |           |             |           |             |           | -----                     |                   |                    |                 | Mor77          |
| I               | Prograde rotation   |           |             |           |             |           |             |           | -----                     |                   |                    |                 | Han77          |
| P               |   |           | 270° +36°   | —P—       |             |           |             |           | -----                     |                   |                    |                 | Joh+83         |
| R               | Concentric ring region <sup>6</sup>                             |           |             |           |             |           |             |           | -----                     |                   |                    |                 | Ost87          |
| S               | —S—   |           | 332° +70°   | —S—       |             |           | —S—         |           | -----                     |                   |                    |                 | Sai+93         |
| S               |   |           | 298° +78°   |           |             |           | 186° -58°   |           | -----                     | 1.08              | 1.06               | X <sup>36</sup> | Dru+98         |
| S               | ————  |           | 7° +83°     | ————      |             |           | ————        |           | 0.378088                  | 1.00              | 1.08               |                 | Car+08         |
| S               | ————  |           | 352° +80°   | ————      |             |           | ————        |           | -----                     | 1.00              | 1.07               |                 | Dru+08         |
| Synthesis       | ————  |           | 355° +81°   | ————      |             |           | ————        |           | 0.378088                  | 1.08              | 1.06               |                 | Synthesis      |
| <b>2 Pallas</b> |   |           |             |           |             |           |             |           |                           |                   |                    |                 |                |
| EZ              |   |           | 228° +43°   | —E—       |             |           |             |           | 0.325440                  |                   |                    |                 | Sch+76         |
| I               | Prograde rotation   |           |             |           |             |           |             |           | -----                     |                   |                    |                 | Mor77          |
| I               | Prograde rotation   |           |             |           |             |           |             |           | -----                     |                   |                    |                 | Han77          |
| Z               |   |           | 211° +38°   | 31° -38°  |             |           |             |           | -----                     |                   |                    |                 | Bur+83         |
| AM              | 44° +4°   |           | 148° +55°   | 224° -4°  |             | 328° -55° |             |           | -----                     | 1.14              | 1.0 <sup>1</sup>   |                 | Zap+84         |
| A               |   |           | 200° +40°   | 20° -40°  |             |           |             |           | -----                     |                   |                    |                 | Bin84          |
| A               |   |           | 220° +15°   | 40° -15°  |             |           |             |           | -----                     |                   |                    |                 | Bin84          |
| A               | 49° +6°   |           | 157° +53°   | 229° -6°  |             | 337° -53° |             |           | -----                     | 1.14              | 1.0 <sup>1</sup>   |                 | Bur+85         |
| R               | Aspect circle <sup>7</sup>                                      |           |             |           |             |           |             |           | -----                     |                   |                    |                 | Ost85          |
| OEAI            | —O—   |           | 227° +20°   | —E—       |             |           | —E—         |           | 0.325995                  | 1.11              | 1.03               |                 | Lam85          |
| OEA             |   |           | —O—         | 54° -6°   |             |           |             |           | 0.32555136                | 1.06              | 1.05               |                 | Mag86          |
| R               | Concentric ring region <sup>6</sup>                             |           |             |           |             |           |             |           | -----                     |                   |                    |                 | Ost87          |
| S               | 100° -22°   |           | 295° +16°   | —S—       |             |           | —S—         |           | -----                     | 1.10              | 1.01               |                 | Dr+89a         |
| O               | 70° +15°  |           | 250° +15°   | 70° -15°  |             | 250° -15° |             |           | -----                     | 1.11              | 1.30               |                 | Dr+89b         |
| L               |   |           | 193° +43°   | 35° -12°  |             |           |             |           | 0.3255510                 | 1.1               | 1.05 <sup>31</sup> |                 | Tor+03         |
| S               | ————  |           | ————        | 32° -21°  |             | ————      |             |           | -----                     | 1.08              | 1.5                |                 | Dru+08         |
| S               | ————  |           | ————        | 34° -27°  |             | ————      |             |           | -----                     | 1.09              | 1                  |                 | Dru+09         |
| S               | ————  |           | ————        | 30° -16°  |             | ————      |             |           | -----                     | 1.07              | 1.08               |                 | Car+10         |
| Synthesis       | ————  |           | ————        | 32° -20°  |             | ————      |             |           | 0.3255510                 | 1.1               | 1.1                |                 | Synthesis      |
| <b>3 Juno</b>   |   |           |             |           |             |           |             |           |                           |                   |                    |                 |                |
| EA              | 71° +49°  |           |             |           |             | —E—       |             |           | 0.3004950                 |                   |                    |                 | Cha+62         |
| AM              | 101° +29°   |           | 321° +57°   | 141° -57° |             | 281° -29° |             |           | -----                     | 1.23              | 1.0 <sup>1</sup>   |                 | Zap+84         |
| OEA             | 110° +40°   |           | —O—         | —E—       |             |           | —E—         |           | 0.30040                   | 1.20              | 1.02               |                 | Mag86          |
| E               | 104° +36°   |           | 316° +62°   | —E—       |             |           | —E—         |           | 0.3003969                 |                   |                    |                 | Bir+89         |
| EAM             | 108° +34°   |           |             | —E—       |             |           | —E—         |           | 0.3003970                 | 1.18              | 1.0 <sup>2</sup>   |                 | Eri+93         |
| EA              | 108° +38°   |           |             | —E—       |             |           | —E—         |           | 0.3003970                 | 1.20              | 1.26               |                 | Dot+95         |
| L               | 103° +27°   |           |             | ————      |             |           | ————        |           | 0.3003971                 | 1.2               | 1.3 <sup>31</sup>  |                 | Ka+02a         |
| S               | 118° +30°   |           |             | ————      |             |           | ————        |           | -----                     | 1.2               | 1.07               |                 | Dru+08         |
| Synthesis       | 110° +32°   |           |             | ————      |             |           | ————        |           | 0.3003970                 | 1.2               | 1.2                |                 | Synthesis      |

| Basic data       | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |                                     |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg.  | Reference code |
|------------------|---|-------------------------------------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|-----------------|----------------|
|                  | $\lambda_0$   | $\beta_0$                           | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                 |                |
| <b>4 Vesta</b>   |   |                                     |             |           |             |           |             |           |                           |                     |                   |                 |                |
| EA               | 14° +80°  |                                     |             |           |             |           |             | —E—       | 0.2227006                 |                     |                   |                 | Cai56          |
| EA               | —E—   |                                     | —E—         |           |             |           |             | −90°      | 0.4453666                 | 1.14                | 1.0 <sup>1</sup>  |                 | Hau58          |
| EA               | 57° +74°  |                                     |             |           |             |           |             | —E—       | 0.2225884                 |                     |                   |                 | Cha+62         |
| E                | 126° +65°   |                                     |             |           |             |           |             | —E—       | 0.22258871                |                     |                   |                 | Geh67          |
| E                | 139° +47°   | 333° +39°                           |             |           |             |           |             | —E—       | 0.4451021                 | shape <sup>21</sup> |                   |                 | Tay73          |
| I                | Prograde rotation   |                                     |             |           |             |           |             |           | -----                     |                     |                   |                 | Mor77          |
| I                | Prograde rotation   |                                     |             |           |             |           |             |           | -----                     |                     |                   |                 | Han77          |
| E                | 103° +43°   | 301° +33°                           |             |           |             |           |             | —E—       | 0.2225889                 |                     |                   |                 | Tay+85         |
| E                | 120° +65°   | 325° +55°                           |             |           |             |           |             | —E—       | 0.22258849                | 1.01                | 1.4 <sup>2</sup>  |                 | Mag86          |
| AM               | 85° +58°  | 310° +60°                           |             |           |             |           |             |           | -----                     | 1.0 <sup>1</sup>    | 1.27              | X <sup>18</sup> | Cel+87         |
| SE               | —S—   | 336° +55°                           |             |           |             |           |             |           | 0.2225887                 | 1.10                | 1.14              | X <sup>20</sup> | Dr+88a         |
| S                | —S—   | 311° +67°                           |             |           |             |           |             | —S—       | -----                     | 1.07                | 1.14              |                 | Dr+89a         |
| EA               | 160° +52°   | 340° +40°                           |             |           |             |           |             | —E—       | 0.2225885                 |                     |                   |                 | Rey+93         |
| S                | —   | 343° +56°                           |             |           |             |           |             |           | -----                     | 1.06                | 1.15              |                 | McC+94         |
| S                | —S—   | 336° +63°                           |             |           |             |           |             | —S—       | -----                     | 1.03                | 1.2               |                 | Tho+97         |
| S                | —   | 321° +62°                           |             |           |             |           |             |           | -----                     | 1.05                | 1.26              |                 | Dru+98         |
| S                | —   | 341° +51°                           |             |           |             |           |             |           | -----                     | 1.03                | 1.2               |                 | Dru+08         |
| Synthesis        | —   | 330° +54°                           |             |           |             |           |             |           | 0.2225886                 | 1.05                | 1.2               |                 | Synthesis      |
| <b>5 Astraea</b> |   |                                     |             |           |             |           |             |           |                           |                     |                   |                 |                |
| E                |   |                                     |             |           |             |           |             | 328° −9°  | 0.7005047                 |                     |                   |                 | Tay78          |
| AM               | 131° +49°   | 328° +46°                           | 148° −46°   |           |             |           |             | 310° −49° | -----                     | 1.29                | 1.0 <sup>1</sup>  |                 | Za+86b         |
| R                |   | Concentric ring region <sup>6</sup> |             |           |             |           |             |           | -----                     |                     |                   |                 | Ost87          |
| EA               | 125° +46°   | 318° +44°                           |             |           |             |           |             | —E—       | 0.700026                  | 1.27                |                   |                 | Eri+93         |
| EA               | 114° +57°   |                                     |             |           |             |           |             | —E—       | 0.700026                  | 1.21                | 1.15              |                 | DeA95          |
| AM               |   | 312° +58°                           | 132° −58°   |           |             |           |             |           | -----                     | 1.44                | 1.30              |                 | Bla+00         |
| L                | 126° +40°   | 310° +44°                           |             |           |             |           |             |           | 0.700025                  | shape <sup>31</sup> |                   |                 | Dur+09         |
| Synthesis        | 125° +45°   | 315° +46°                           |             |           |             |           |             |           | 0.700025                  | 1.24                |                   |                 | Synthesis      |
| <b>6 Hebe</b>    |   |                                     |             |           |             |           |             |           |                           |                     |                   |                 |                |
| A                | 145° +15°   |                                     |             |           |             |           |             | —E—       | -----                     |                     |                   |                 | Geh+62         |
| E                |   | 365° +50°                           |             |           |             |           |             |           | 0.3031020                 | 1.15                | 1.0 <sup>1</sup>  |                 | Geh+77         |
| AM               | 130° +33°   | 344° +30°                           | 164° −30°   |           |             |           |             | 310° −33° | -----                     | 1.24                | 1.0 <sup>1</sup>  |                 | Zap+84         |
| OEA              | —O—   | 355° +50°                           |             |           |             |           |             | —E—       | 0.3031025                 | 1.14                | 1.2               |                 | Mag86          |
| R                |   | Concentric ring region <sup>6</sup> |             |           |             |           |             |           | -----                     |                     |                   |                 | Ost87          |
| E                |   | 363° +60°                           |             |           |             |           |             | —E—       | 0.3031024                 |                     |                   |                 | Mic88          |
| EA               |   | 365° +27°                           |             |           |             |           |             | —E—       | 0.3031023                 | 1.13                | 1.06              |                 | DeA95          |
| EA               | —O—   | 353° +24°                           |             |           |             |           |             | —E—       | 0.3031026                 | 1.14                | 1.00              |                 | Dot+95         |
| EA               |   | check <sup>5</sup>                  |             |           |             |           |             |           | -----                     |                     |                   |                 | Lag+95         |
| AM               | 128° +30°   |                                     |             |           |             |           |             | 308° −30° | -----                     | 1.32                | 1.11              |                 | Bla+00         |
| L                | —   | 339° +45°                           |             |           |             |           |             |           | 0.3031029                 | 1.1                 | 1.1 <sup>31</sup> |                 | Tor+03         |
| Synthesis        | —O—   | 355° +41°                           |             |           |             |           |             | —E—       | 0.3031026                 | 1.17                | 1.1               |                 | Synthesis      |

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|------------------|---|-----------|-------------------------------------|-----------|-------------|-----------|---------------------|-----------|---------------------------|-------------------|--------------------|----------------|----------------|
|                  | $\lambda_0$   | $\beta_0$ | $\lambda_0$                         | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$         | $\beta_0$ |                           | a/b               | b/c                |                |                |
| <b>7 Iris</b>    |   |           |                                     |           |             |           |                     |           |                           |                   |                    |                |                |
| EA               |   |           | 184° +55°                           |           | —E—         |           |                     |           | 0.2967853                 |                   | shape <sup>9</sup> |                | Cai56          |
| AM               |   |           | 193° +15°                           |           | 13° -15°    |           |                     |           | -----                     |                   |                    |                | Geh+62         |
| AM               | 11° +41°  |           |                                     |           |             |           | 191° -41°           |           | -----                     | 1.31              | 1.35               |                | Tay77          |
| EA               | 15° +25°  |           | 195° +15°                           |           | —E—         |           | —E—                 |           | 0.29745197                | 1.18              | 1.40               |                | Mag86          |
| AM               | 18° +33°  |           | 193° +16°                           |           | 13° -16°    |           | 198° -33°           |           | -----                     | 1.19              | 1.21               |                | Za+86b         |
| R                |   |           | Concentric ring region <sup>6</sup> |           |             |           |                     |           | -----                     |                   |                    |                | Ost87          |
| EA               | 8° +35°   |           | 187° +5°                            |           | —E—         |           | —E—                 |           | 0.29745195                | 1.24              | 1.36               |                | DeA95          |
| R                | 15° +25°  |           |                                     |           |             |           |                     |           | -----                     |                   |                    |                | Mit+95         |
| L                | 20° +10°  |           | 200° +10°                           |           | ————        |           | ————                |           | 0.2974517                 | 1.2               | 1.0 <sup>31</sup>  |                | Ka+02a         |
| Synthesis        | 15° +28°  |           | 196° +10°                           |           | —E—         |           | —E—                 |           | 0.2974519                 | 1.2               | 1.2                |                | Synthesis      |
| <b>8 Flora</b>   |   |           |                                     |           |             |           |                     |           |                           |                   |                    |                |                |
| A                | 157° +10°   |           |                                     |           |             |           | —E—                 |           | -----                     |                   |                    |                | Geh+62         |
| A                | 140°  |           | 320°                                |           | 140°        |           | 320°                |           | -----                     |                   |                    |                | Zap+83         |
| A                | 148° +45°   |           | 328° +45°                           |           | 148° -45°   |           | 328° -45°           |           | -----                     | 1.12              | 1                  |                | Hol+87         |
| AM               | 135° +43°   |           | 327° +32°                           |           | 147° -32°   |           | 315° -43°           |           | -----                     | 1.10              | 1.28               |                | DiM+89         |
| EA               | 139° +14°   |           |                                     |           |             |           | 319° -14°           |           | -----                     | 1.05              | 1.16               |                | DeA95          |
| AM               | 122° +37°   |           |                                     |           |             |           | 302° -37°           |           | -----                     | 1.097             | 1.062              |                | Bla+98         |
| L                | 160° +16°   |           | ————                                |           | ————        |           | ————                |           | 0.533292                  | 1.0               | 1.2 <sup>31</sup>  |                | Tor+03         |
| Synthesis        | 140° +22°   |           | ————                                |           | ————        |           | ————                |           | 0.533292                  | 1.05              | 1.2                |                | Synthesis      |
| <b>9 Metis</b>   |   |           |                                     |           |             |           |                     |           |                           |                   |                    |                |                |
| AM               | 156° +15°   |           |                                     |           |             |           | 336° -15°           |           | -----                     |                   |                    |                | Geh+62         |
| A                |   |           | 348° +76°                           |           | 168° -76°   |           |                     |           | -----                     |                   |                    |                | Cha+62         |
| AM               | 191° +56°   |           |                                     |           |             |           | 371° -56°           |           | -----                     | 1.30              | 1.70               |                | Zap+79         |
| AM               | 186° +43°   |           | 362° +26°                           |           | 182° -26°   |           | 366° -43°           |           | -----                     | 1.32              | 1.34               |                | Zap+84         |
| R                |   |           | Concentric ring region <sup>6</sup> |           |             |           |                     |           | -----                     |                   |                    |                | Ost87          |
| EAM              | 183° +25°   |           | 361° +9°                            |           | —E—         |           | —E—                 |           | 0.2116324                 | 1.27              | 1.26               |                | Dr+88b         |
| EAM              | 180° +30°   |           | 360° +20°                           |           | —E—         |           | —E—                 |           | 0.2116322                 | 1.27              | 1.26               |                | Mag90a         |
| EAM              | 181° +23°   |           | 360° +7°                            |           | —E—         |           | —E—                 |           | 0.2116323                 | 1.27              | 1.24               |                | Dru+91         |
| EA               | 185° +31°   |           |                                     |           | —E—         |           | —E—                 |           | 0.2116323                 | 1.31              | 1.22               |                | DeA95          |
| L                | 181° +23°   |           | 359° +9°                            |           | ————        |           | ————                |           | 0.2116325                 | 1.2               | 1.4 <sup>31</sup>  |                | Tor+03         |
| Synthesis        | 182° +26°   |           | 360° +11°                           |           | —E—         |           | —E—                 |           | 0.2116324                 | 1.3               | 1.3                |                | Synthesis      |
| <b>10 Hygiea</b> |   |           |                                     |           |             |           |                     |           |                           |                   |                    |                |                |
| I                |   |           |                                     |           |             |           | Retrograde rotation |           | -----                     |                   |                    |                | Mor77          |
| EA               | —E—   |           | —E—                                 |           | 112° -41°   |           | 299° -39°           |           | 1.152462                  | 1.36              | 1.04               |                | Mic+91         |
| EA               | —E—   |           | —E—                                 |           | 100° -34°   |           | 285° -34°           |           | 1.150969                  | 1.28              | 0.65               |                | Eri+93         |
| EAM              | —E—   |           | —E—                                 |           | 117° -37°   |           | 304° -35°           |           | 1.150977                  | 1.30              | 1.18               |                | Mic93          |
| AM               | 118° +44°   |           |                                     |           |             |           | 298° -44°           |           | -----                     | 1.343             | 1.144              |                | Bla+98         |
| AM               | 122° +42°   |           |                                     |           |             |           | 302° -42°           |           | -----                     | 1.343             | 1.144              |                | Bla+98         |
| L                | ————  |           | ————                                |           | 115° -30°   |           | 300° -30°           |           | 1.150967                  | 1.3               | 1.1 <sup>31</sup>  |                | Ka+02a         |
| Synthesis        | —E—   |           | —E—                                 |           | 111° -36°   |           | 298° -37°           |           | 1.15097                   | 1.29              |                    |                | Synthesis      |

| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                                     |           |                     |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                   | Albedo varieg. | Reference code |
|----------------------|---|-----------|-------------------------------------|-----------|---------------------|-----------|-------------|-----------|---------------------------|-------------------|-------------------|----------------|----------------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$                         | $\beta_0$ | $\lambda_0$         | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c               |                |                |
| <b>11 Parthenope</b> |   |           |                                     |           |                     |           |             |           |                           |                   |                   |                |                |
| AM                   | 64°   | +38°      | 253°                                | +51°      | 73°                 | -51°      | 244°        | -38°      | -----                     | 1.225             | 1.208             |                | Bla+98         |
| <b>12 Victoria</b>   |   |           |                                     |           |                     |           |             |           |                           |                   |                   |                |                |
| A                    |   |           | 242°                                | +17°      | 62°                 | -17°      |             |           | 0.36060                   |                   |                   |                | Tem+69         |
| R                    |   |           | Concentric ring region <sup>6</sup> |           |                     |           |             |           | -----                     |                   |                   |                | Ost87          |
| EA                   | 9°  | +55°      | 176°                                | +40°      | —E—                 |           | —E—         |           | 0.3608665                 | 1.25              | 1.00              |                | Dot+95         |
| L                    | —   | —         | 137°                                | +55°      | —                   | —         | —           | —         | 0.360829                  | 1.3               | 1.3 <sup>31</sup> |                | Tor+03         |
| Synthesis            | —   | —         | 150°                                | +50°      | —E—                 |           | —E—         |           | 0.36085                   | 1.3               |                   |                | Synthesis      |
| <b>13 Egeria</b>     |   |           |                                     |           |                     |           |             |           |                           |                   |                   |                |                |
| AM                   | 103°  | +13°      |                                     |           |                     |           | 283°        | -13°      | -----                     | 1.43              | 1.26              |                | Bla+00         |
| <b>14 Irene</b>      |   |           |                                     |           |                     |           |             |           |                           |                   |                   |                |                |
| AM                   |   |           | 270°                                | +34°      | 90°                 | -34°      |             |           | -----                     | 1.148             | 1.080             |                | Bla+98         |
| <b>15 Eunomia</b>    |   |           |                                     |           |                     |           |             |           |                           |                   |                   |                |                |
| EA                   | —E—   |           | —E—                                 |           | -90°                |           | -90°        |           | 0.253448                  |                   |                   |                | Gro+54         |
| EA                   | —E—   |           | —E—                                 |           |                     |           | 337°        | -82°      | 0.25344810                | 1.51              | ?                 |                | Cai56          |
| EA                   | —E—   |           | —E—                                 |           | -90°                |           | -90°        |           | 0.253448                  |                   |                   |                | HG+58          |
| EA                   | —E—   |           | —E—                                 |           | 70°                 | -74°      |             |           | 0.25344810                |                   |                   |                | Cai60          |
| EA                   | —E—   |           | —E—                                 |           | -90°                |           | -90°        |           | 0.25336                   |                   |                   |                | Sca+75         |
| A                    | 164°  | +52°      | —                                   | —         |                     |           | 344°        | -52°      | -----                     | 1.6               | 1.0 <sup>1</sup>  |                | Pii+85         |
| A                    | 170°  | +57°      | —                                   | —         |                     |           | 350°        | -57°      | -----                     | 1.6               | 1.4 <sup>1</sup>  |                | Pii+85         |
| E                    | Prograde rotation   |           | —E—                                 |           | —E—                 |           | —E—         |           | 0.25336                   |                   |                   |                | Lup+85         |
| EA                   | —E—   |           | —E—                                 |           | 106°                | -73°      | 351°        | -61°      | 0.25344806                | 1.50              | 1.0               |                | Mag86          |
| E                    | —E—   |           | —E—                                 |           | 131°                | -71°      | 360°        | -50°      | 0.25344810                |                   |                   |                | Mic88          |
| EAM                  | —E—   |           | —E—                                 |           | 82°                 | -78°      | 352°        | -61°      | 0.25344805                | 1.40              | 1.06              |                | Dr+88b         |
| EA                   | —E—   |           | —E—                                 |           | 108°                | -74°      | 350°        | -59°      | 0.25344808                | 1.44              | 1.0               |                | Mag90a         |
| EAM                  | —E—   |           | —E—                                 |           | 106°                | -73°      | —           |           | 0.25344806                | 1.44              | 1.02              |                | Dru+91         |
| EA                   | —E—   |           | —E—                                 |           | 96°                 | -63°      |             |           | 0.25344806                | 1.47              | 1.00              |                | DeA92          |
| E                    | —E—   |           | —E—                                 |           | Retrograde rotation |           |             |           | -----                     |                   |                   |                | Kru+92         |
| EAM                  | —E—   |           | —E—                                 |           | 102°                | -76°      | 354°        | -57°      | 0.25344814                | 1.36              | 1.20              |                | Mic93          |
| EA                   | —E—   |           | —E—                                 |           | 106°                | -73°      |             |           | 0.25344806                | 1.47              | 1.00              |                | DeA95          |
| L                    | —   | —         | —                                   | —         |                     |           | 355°        | -65°      | 0.25344800                | 1.4               | 1.2 <sup>31</sup> |                | Ka+02a         |
| Synthesis            | —E—   |           | —E—                                 |           | 106°                | -74°      | 353°        | -60°      | 0.25344808                | 1.42              | 1.1               |                | Synthesis      |

| Basic data          | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                                     |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                     | Albedo varieg. | Reference code |
|---------------------|---|-----------|-------------------------------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|---------------------|----------------|----------------|
|                     | $\lambda_0$   | $\beta_0$ | $\lambda_0$                         | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c                 |                |                |
| <b>16 Psyche</b>    |   |           |                                     |           |             |           |             |           |                           |                   |                     |                |                |
| EZ                  | ————  |           | 225°                                | +5°       | —E—         |           | —E—         |           | 0.17483120                |                   |                     |                | Zho+82         |
| Z                   |   |           | 222°                                | +4°       | 42°         | -4°       |             |           | 0.174831                  | 1.3               | 1.3                 |                | Lup+83         |
| AM                  | 40°   | +23°      | 217°                                | +31°      | 37°         | -31°      | 220°        | -23°      | -----                     | 1.32              | 1.26                |                | Zap+84         |
| E                   | 41°   | +33°      | 223°                                | +37°      |             |           |             |           | 0.1748143                 |                   |                     |                | Ted+85         |
| AM                  | 39°   | +35°      | 220°                                | +40°      | 40°         | -40°      | 219°        | -35°      | -----                     | 1.33              | 1.33                |                | Ted+85         |
| EA                  | —E—   |           | —E—                                 |           | 36°         | -21°      | 217°        | -14°      | 0.17483113                | 1.19              | 1.16                |                | Mag86          |
| R                   |   |           | Concentric ring region <sup>6</sup> |           |             |           |             |           | -----                     |                   |                     |                | Ost87          |
| EAM                 | —E—   |           | —E—                                 |           |             |           | 215°        | -17°      | 0.17483117                | 1.27              | 1.35                |                | Dr+88b         |
| EAM                 | —E—   |           | —E—                                 |           | 35°         | -19°      | 216°        | -12°      | 0.17483106                | 1.16              | 1.34                |                | Mag90a         |
| AMF                 | 37°   | +0°       | 217°                                | +8°       | 37°         | -8°       | 217°        | -0°       | -----                     |                   |                     |                | Lum+90         |
| AM                  | 33°   | +25°      | 211°                                | +29°      | 31°         | -29°      | 213°        | -25°      | -----                     | 1.39              | 1.38                |                | Dot+92         |
| EA                  | —E—   |           | —E—                                 |           | 35°         | -27°      | 215°        | -22°      | 0.17483104                | 1.35 <sup>2</sup> | 1.36                |                | DeA93          |
| L                   | ————  |           | ————                                |           | 35°         | -9°       | 216°        | -2°       | 0.17483113                | 1.2               | 1.2 <sup>31</sup>   |                | Ka+02a         |
| S                   | ————  |           | ————                                |           | 36°         | -3°       | ————        |           | -----                     | 1.00              | 1.54                |                | Dru+08         |
| Synthesis           | —E—   |           | —E—                                 |           | 35°         | -10°      | 216°        | -10°      | 0.1748311                 | 1.2               | 1.3                 |                | Synthesis      |
| <b>17 Thetis</b>    |   |           |                                     |           |             |           |             |           |                           |                   |                     |                |                |
| AM                  | 69°   | +43°      | 268°                                | +55°      | 88°         | -55°      | 249°        | -43°      | -----                     | 1.25              | 1.35 <sup>1</sup>   |                | Za+86b         |
| EA                  |   |           | Prograde rotation                   |           | —E—         |           | —E—         |           | -----                     |                   |                     |                | Lag+95         |
| EAM                 | —E—   |           | —E—                                 |           |             |           | 253°        | -33°      | 0.5112699                 | 1.40              | 1.40                |                | Mic+95         |
| L                   | 58°   | +12°      | 240°                                | +25°      | ————        |           | ————        |           | 0.5110845                 | 1.3               | 1.0 <sup>31</sup>   |                | Tor+03         |
| L                   | 55°   | +10°      | 236°                                | +20°      | ————        |           | ————        |           | 0.511085                  |                   | shape <sup>31</sup> |                | Dur+09         |
| Synthesis           | 57°   | +11°      | 238°                                | +23°      | ————        |           | ————        |           | 0.5110845                 | 1.3               | 1.0                 |                | Synthesis      |
| <b>18 Melpomene</b> |   |           |                                     |           |             |           |             |           |                           |                   |                     |                |                |
| EA                  | —E—   |           | —E—                                 |           | 0°          | -0°       | 341°        | -36°      | 0.482218                  |                   |                     |                | Hof+90         |
| L                   | ————  |           | ————                                |           | 199°        | -24°      | 8°          | -37°      | 0.482142                  | 1.2               | 1.2 <sup>31</sup>   |                | Tor+03         |
| Synthesis           | ————  |           | ————                                |           | 190°        | -20°      | 355°        | -37°      | 0.482142                  | 1.2               | 1.2                 |                | Synthesis      |
| <b>19 Fortuna</b>   |   |           |                                     |           |             |           |             |           |                           |                   |                     |                |                |
| I                   |   |           | Prograde rotation                   |           |             |           |             |           | -----                     |                   |                     |                | Mor77          |
| I                   |   |           | Prograde rotation                   |           |             |           |             |           | -----                     |                   |                     |                | Han77          |
| E                   |   |           | Prograde rotation                   |           | —E—         |           | —E—         |           | 0.310125                  |                   |                     |                | Lup+85         |
| R                   |   |           | Concentric ring region <sup>6</sup> |           |             |           |             |           | -----                     |                   |                     |                | Ost87          |
| EAM                 | 65°   | +48°      | ————                                |           | —E—         |           | —E—         |           | 0.3101343                 | 1.24              | 0.94                |                | Dr+88b         |
| E                   | 70°   | +50°      | 250°                                | +50°      | —E—         |           | —E—         |           | 0.3101342                 | 1.21              | 1.1                 |                | Mag90a         |
| EAM                 | 68°   | +52°      | ————                                |           | —E—         |           | —E—         |           | 0.3101343                 | 1.23              | 0.93                |                | Dru+91         |
| EA                  | 98°   | +51°      | 266°                                | +48°      | —E—         |           | —E—         |           | 0.3101340                 | 1.27              | 1.00                |                | DeA95          |
| AM                  | 65°   | +49°      | 244°                                | +48°      | 64°         | -48°      | 245°        | -49°      | -----                     | 1.445             | 1.096               |                | Bla+98         |
| L                   | 98°   | +58°      | 277°                                | +60°      | ————        |           | ————        |           | 0.3101342                 | 1.2               | 1.05 <sup>31</sup>  |                | Tor+03         |
| Synthesis           | 80°   | +52°      | 260°                                | +52°      | —E—         |           | —E—         |           | 0.3101342                 | 1.2               | 1.0                 |                | Synthesis      |

| Basic data         | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                   | Albedo varieg. | Reference code |
|--------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|-------------------|----------------|----------------|
|                    | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c               |                |                |
| <b>20 Massalia</b> |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| A                  | 10°   | +78°      |             |           |             |           | 190°        | -78°      | -----                     |                   |                   |                | Cha+62         |
| AM                 | 30°   | +49°      | 207°        | +51°      | 27°         | -51°      | 210°        | -49°      | -----                     | 1.27              | 1.0 <sup>1</sup>  |                | Bar+85         |
| A                  | 30°   | +54°      | 205°        | +79°      | 25°         | -79°      | 210°        | -54°      | -----                     | 1.25              | 2.4 <sup>2</sup>  |                | McC+85         |
| E                  | —E—   |           | —E—         |           |             |           |             |           | 0.337419                  |                   |                   |                | Lup+85         |
| EA                 | 20°   | +80°      | 200°        | +80°      | —E—         |           | —E—         |           | 0.3373993                 | 1.16              |                   |                | Mag86          |
| E                  | Prograde rotation   |           |             |           | —E—         |           | —E—         |           | -----                     |                   |                   |                | Kru+92         |
| EA                 | 31°   | +69°      | 208°        | +69°      | —E—         |           | —E—         |           | 0.3373994                 | 1.27              | 1.00              |                | Dot+95         |
| E                  | 27°   | +38°      | 207°        | +38°      | —E—         |           | —E—         |           | 0.3373987                 |                   |                   |                | Sza+99         |
| L                  | 10°   | +45°      | 189°        | +45°      | ————        |           | ————        |           | 0.33740475                | 1.1               | 1.1 <sup>31</sup> |                | Ka+02a         |
| Synthesis          | 23°   | +59°      | 203°        | +60°      | —E—         |           | —E—         |           | 0.337399                  | 1.15              | 1.1               |                | Synthesis      |
| <b>21 Lutetia</b>  |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| E                  | Prograde rotation   |           |             |           | —E—         |           | —E—         |           | 0.340277                  |                   |                   |                | Lu+87a         |
| AM                 | 42°   | +40°      | 223°        | +48°      | 43°         | -48°      | 222°        | -40°      | -----                     | 1.25              | 1.09              |                | Lu+87c         |
| EAM                | 55°   | +44°      | 241°        | +40°      | —E—         |           | —E—         |           | 0.3400260                 | 1.30              | 1.7 <sup>2</sup>  |                | Mic92          |
| A                  | 48°   | +31°      | 233°        | +38°      | 53°         | -38°      | 228°        | -31°      | -----                     | 1.29              | 1.25              |                | Dot+92         |
| EAM                | 33°   | +9°       | 214°        | +15°      | —E—         |           | —E—         |           | 0.340244                  | 1.25              | 2.7               |                | Mic93          |
| EA                 | 41°   | +42°      |             |           | —E—         |           | —E—         |           | 0.3400252                 | 1.41              | 1.08              |                | DeA95          |
| EA                 | 50°   | +10°      | 230°        | +10°      | —E—         |           | —E—         |           | 0.340151                  | 1.22              | 1.4               |                | Lag+95         |
| EAM                | ————  |           | 240°        | +37°      | —E—         |           | —E—         |           | 0.3404874                 | 1.26              | 1.15              |                | Mic96a         |
| E                  | 41°   | +51°      | 221°        | +51°      | —E—         |           | —E—         |           | 0.3402446                 |                   |                   |                | Sza+99         |
| R                  | 48°   | +5°       | 228°        | +13°      | ————        |           | ————        |           | -----                     | 1.25              | 1.41              |                | Mag+99         |
| L                  | 39°   | +3°       | 220°        | +3°       | ————        |           | ————        |           | 0.3402272                 | 1.2               | 1.2 <sup>31</sup> |                | Tor+03         |
| Synthesis          | 42°   | +10°      | 225°        | +10°      | —E—         |           | —E—         |           | 0.34025                   | 1.25              | 1.2               |                | Synthesis      |
| <b>22 Kalliope</b> |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| AM                 |   |           | 215°        | +45°      | 35°         | -45°      |             |           | -----                     | 1.34              | 1.23              |                | Sca+78         |
| AM                 | 13°   | +17°      | 214°        | +42°      | 34°         | -42°      | 193°        | -17°      | -----                     | 1.34              | 1.18              |                | Zap+84         |
| EAM                |   |           | 199°        | +14°      | 19°         | -11°      |             |           | 0.1728092                 | 1.4               | 1.18              |                | Mag86          |
| A                  |   |           | 203°        | +29°      | 23°         | -29°      |             |           | -----                     | 1.33              | 1.24              |                | Sur+86         |
| M                  |   |           | 201°        | +22°      | 21°         | -22°      |             |           | -----                     | 1.32              | 1.13              |                | Sur+86         |
| EAM                | —E—   |           | —E—         |           | ————        |           | 194°        | -8°       | 0.17284164                | 1.32              | 1.27              |                | Dr+88b         |
| EAM                |   |           |             |           | 20°         | -23°      | 195°        | +2°       | 0.1728416                 | 1.6               | 1.2               |                | Mag90a         |
| EA                 | —E—   |           | —E—         |           | 18°         | -23°      |             |           | 0.17284168                | 1.32              | 1.18              |                | Mi+90a         |
| AMF                | 18°   | +0°       | 204°        | +23°      | 24°         | -23°      | 198°        | -0°       | -----                     |                   |                   |                | Lum+90         |
| EAM                | —E—   |           | —E—         |           | ————        |           | 193°        | -7°       | 0.17284164                | 1.31              | 1.27              |                | Dru+91         |
| EA                 | —E—   |           | —E—         |           | ————        |           | 190°        | -1°       | 0.1728415                 | 1.33              | 1.27              |                | DeA92          |
| A                  | 10°   | +12°      | 203°        | +45°      | 23°         | -45°      | 190°        | -12°      | -----                     | 1.32              | 1.18              |                | Dot+92         |
| EA                 | —E—   |           | —E—         |           | ————        |           | 190°        | -1°       | 0.17284154                | 1.33              | 1.27              |                | DeA95          |
| L                  | ————  |           | ————        |           | 20°         | -21°      | 197°        | +6°       | 0.17284167                | 1.2               | 1.2 <sup>31</sup> |                | Ka+02a         |
| Synthesis          | —E—   |           | —E—         |           | 21°         | -22°      | 193°        | 0°        | 0.1728416                 | 1.3               | 1.2               |                | Synthesis      |

| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                     | Albedo varieg. | Reference code |
|----------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|---------------------|----------------|----------------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c                 |                |                |
| <b>23 Thalia</b>     |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| A D                  | Solution curve  |           |             |           |             |           |             |           | -----                     | 1.15 <sup>2</sup> |                     |                | Tan+91         |
| EAM                  | 198° +72°   | 354° +47° | —E—         | —E—       | —E—         | —E—       | —E—         | —E—       | 0.5133960                 | 1.18              | 1.45                |                | Mic93          |
| EA                   | —E—   | —E—       | 15° -55°    | 180° -35° | —E—         | —E—       | —E—         | —E—       | 0.513202                  | 1.28              |                     |                | Lag+95         |
| L                    | —E—   | —E—       | 359° -55°   | —E—       | —E—         | —E—       | —E—         | —E—       | 0.5130                    | 1.1               | 1.3 <sup>31</sup>   |                | Tor+03         |
| Synthesis            | —E—   | —E—       | 7° -55°     | —E—       | —E—         | —E—       | —E—         | —E—       | 0.5131                    | 1.2               | 1.3                 |                | Synthesis      |
| <b>24 Themis</b>     |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| AM                   |   | 274° +52° | 94° -52°    |           |             |           |             |           | -----                     | 1.191             | 1.148               |                | Bla+98         |
| <b>26 Proserpina</b> |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| AM                   |   | 227° -4°  | 47° -4°     |           |             |           |             |           | -----                     | 1.16              | 1.40                |                | Bla+00         |
| AM                   |   | 227° 0°   | 47° 0°      |           |             |           |             |           | -----                     | 1.16              | 1.40                |                | Bla+00         |
| <b>28 Bellona</b>    |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| AM                   | 93° +18°  | 285° +37° | 105° -37°   | 273° -18° |             |           |             |           | -----                     | 1.31              | 1.18                |                | Zap+84         |
| EAM                  | 73° +17°  | 265° +43° | —E—         | —E—       | —E—         | —E—       | —E—         | —E—       | -----                     | 1.24              | 1.20                |                | Mic93          |
| L                    | —E—   | —E—       |             | -6°       | -6°         |           |             |           | 0.654494                  |                   |                     |                | Dur+09         |
| <b>29 Amphitrite</b> |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| A                    | 165° +45°   | 345° +45° | 165° -45°   | 345° -45° |             |           |             |           | -----                     | 1.14              | 1.0 <sup>1</sup>    |                | Ted+81         |
| A                    | 160° +53°   | 320° +45° | 140° -45°   | 340° -53° |             |           |             |           | -----                     | 1.13              | 1.00                |                | McC+84         |
| AM                   | 142° +50°   | 308° +40° | 128° -40°   | 322° -50° |             |           |             |           | -----                     | 1.13              | 1.0 <sup>1</sup>    |                | Zap+84         |
| EAM                  | —E—   | —E—       | 135° -15°   | 320° -25° |             |           |             |           | 0.22458835                | 1.06              | 1.06                |                | Mag86          |
| EAM                  | —E—   | —E—       | 136° -33°   | —E—       |             |           |             |           | 0.2245882                 | 1.13              | 1.14                |                | Dr+88b         |
| S                    | —S—   | —S—       | 134° -36°   | —S—       |             |           |             |           | -----                     | 1.22              | 1.06                |                | Dr+89a         |
| EAM                  | —E—   | —E—       | 133° -17°   | 318° -25° |             |           |             |           | 0.22458829                | 1.05              | 1.16                |                | Mag90a         |
| EA                   | —E—   | —E—       | 145° -43°   |           |             |           |             |           | 0.22458832                | 1.18              | 1.00                |                | DeA95          |
| L                    | —E—   | —E—       | 138° -21°   | —E—       |             |           |             |           | 0.22458829                | 1.1               | 1.1 <sup>31</sup>   |                | Ka+02a         |
| Synthesis            | —E—   | —E—       | 136° -28°   | —E—       |             |           |             |           | 0.2245883                 | 1.1               | 1.1                 |                | Synthesis      |
| <b>30 Urania</b>     |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| EAM                  | 114° +34°   | 293° +33° |             |           |             |           |             |           | -----                     | 1.5               | 1.1                 |                | Mic96a         |
| L                    | 107° +23°   | 284° +20° | —E—         | —E—       |             |           |             |           | 0.570299                  |                   | shape <sup>31</sup> |                | Dur+09         |
| Synthesis L          | 110° +25°   | 288° +25° | —E—         | —E—       |             |           |             |           | 0.570299                  |                   | shape <sup>31</sup> |                | Synthesis      |
| <b>31 Euphrosyne</b> |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| AM                   | 186° +67°   | 317° +4°  | 137° -4°    | 6° -67°   |             |           |             |           | -----                     | 1.12              | 1.0 <sup>1</sup>    |                | Bar+85         |
| A                    | 178° +72°   | 315° +5°  | 135° -5°    | 358° -72° |             |           |             |           | -----                     | 1.12              | 1.00                |                | McC+85         |
| EAM                  | —E—   | —E—       | 126° -31°   | —E—       |             |           |             |           | 0.2316828                 | 1.14              | 1.59                |                | Mic93          |
| A D                  | 300° +75°   | 282° +30° | 102° -30°   | 120° -75° |             |           |             |           | -----                     | 1.08              |                     |                | Lic+94         |
| EAM                  | —E—   | —E—       | —E—         | 273° -60° |             |           |             |           | 0.2304828                 | 1.09              | 1.60                |                | Kry+96         |
| Synthesis            | —E—   | —E—       | —E—         | 273° -60° |             |           |             |           | 0.2304828                 | 1.09              | 1.60                |                | Synthesis      |

| Basic data         | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |            | Sidereal period<br>(days) | Ellipsoidal model   |                 | Albedo varieg. | Reference code |
|--------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|------------|---------------------------|---------------------|-----------------|----------------|----------------|
|                    | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$  |                           | a/b                 | b/c             |                |                |
| <b>32 Pomona</b>   |   |           |             |           |             |           |             |            |                           |                     |                 |                |                |
| AM                 | 91° +34°  | 263° +46° | 83° -46°    | 271° -34° | -----       | -----     | -----       | -----      | 1.34                      | 1.0 <sup>1</sup>    |                 | Za+86b         |                |
| EA                 | 103° +59°   | 267° +70° | —E—         | —E—       | -----       | -----     | -----       | 0.393652   | 1.4                       |                     |                 | Eri+93         |                |
| EA                 | 83° +33°  | 253° +43° | —E—         | —E—       | -----       | -----     | -----       | -----      | 1.76                      | 1.00                |                 | DeA95          |                |
| EA                 | 89° +43°  | 260° +57° | —E—         | —E—       | -----       | -----     | -----       | 0.393654   | 1.40                      | 1.00                |                 | Dot+95         |                |
| L                  | -----   | 267° +58° | -----       | -----     | -----       | -----     | -----       | 0.39365287 | 1.3                       | 1.3 <sup>31</sup>   |                 | Ka+02a         |                |
| Synthesis          | 92° +45°  | 262° +58° | -----       | -----     | -----       | -----     | -----       | 0.393653   | 1.3                       |                     |                 | Synthesis      |                |
| <b>34 Circe</b>    |   |           |             |           |             |           |             |            |                           |                     |                 |                |                |
| AM                 | 113° +17°   |           |             |           |             |           | 293° -17°   | -----      | 1.32                      | 1.00                |                 | Bla+00         |                |
| L                  | 94° +35°  | 275° +51° | -----       | -----     | -----       | -----     | -----       | 0.507274   |                           | shape <sup>31</sup> |                 | Dur+09         |                |
| Synthesis          | 95° +30°  | 278° +45° | -----       | -----     | -----       | -----     | -----       | 0.507274   |                           | shape <sup>31</sup> |                 | Synthesis      |                |
| <b>36 Atalante</b> |   |           |             |           |             |           |             |            |                           |                     |                 |                |                |
| AM                 |   | 299° +19° | 119° -19°   |           |             |           |             | -----      | 1.282                     | 1.000               |                 | Bla+98         |                |
| <b>37 Fides</b>    |   |           |             |           |             |           |             |            |                           |                     |                 |                |                |
| EA                 | 100° +5°  | 280° -5°  |             |           |             |           |             | 0.305573   | 1.2                       |                     |                 | Mag86          |                |
| L                  | -----   | -----     | 85° -26°    | 264° -34° | -----       | -----     | -----       | 0.3055622  | 1.1                       | 1.05 <sup>31</sup>  |                 | Tor+03         |                |
| Synthesis          | -----   | -----     | 85° -26°    | 264° -34° | -----       | -----     | -----       | 0.3055622  | 1.1                       | 1.05                |                 | Synthesis      |                |
| <b>39 Laetitia</b> |   |           |             |           |             |           |             |            |                           |                     |                 |                |                |
| EA                 | —E—   |           |             |           |             |           | 280° -66°   | 0.2144712  |                           | shape <sup>9</sup>  |                 | Cai56          |                |
| A                  | 114° +28°   |           |             |           |             |           | 294° -28°   | -----      |                           |                     |                 | HG+58          |                |
| EA                 | —E—   |           |             |           |             |           | 283° -61°   | 0.2144712  | 1.7                       | 3.3                 |                 | Cai60          |                |
| AM                 | 130° +10°   |           |             |           |             |           | 310° -10°   | -----      |                           |                     |                 | Geh+62         |                |
| M                  | 121° +37°   |           |             |           |             |           | 301° -37°   | -----      | 1.64                      | 1.80                |                 | Sat76          |                |
| A                  | 128° +38°   | 339° +48° | 159° -48°   | 308° -38° | -----       | -----     | -----       | -----      | 1.53                      | 1.31 <sup>2</sup>   |                 | McC+84         |                |
| AM                 | 116° +49°   | 338° +57° | 158° -57°   | 296° -49° | -----       | -----     | -----       | -----      | 1.58                      | 2.08                |                 | Zap+84         |                |
| A                  | 111° +56°   | 365° +70° | 185° -70°   | 291° -56° | -----       | -----     | -----       | -----      | 1.53                      | 3.1 <sup>2</sup>    |                 | McC+85         |                |
| E                  | Prograde rotation   |           | —E—         | —E—       | -----       | -----     | -----       | 0.21409    |                           |                     |                 | Lup+85         |                |
| EAM                | 129° +30°   | 324° +35° | —E—         | —E—       | -----       | -----     | -----       | 0.21409332 | 1.49                      | 1.49                |                 | Mag86          |                |
| EAM                | -----   | 318° +26° | —E—         | —E—       | -----       | -----     | -----       | 0.21409327 | 1.45                      | 1.48                |                 | Dr+88b         |                |
| EAM                | 130° +29°   | 325° +37° | —E—         | —E—       | -----       | -----     | -----       | 0.21409333 | 1.50                      | 1.50                |                 | Mag90a         |                |
| AMF                | 125° +19°   | 317° +26° | 137° -26°   | 305° -19° | -----       | -----     | -----       | -----      |                           |                     |                 | Lum+90         |                |
| EAM                | -----   | 319° +28° | —E—         | —E—       | -----       | -----     | -----       | 0.21409330 | 1.49                      | 1.48                |                 | Dru+91         |                |
| AMF                | -----   | 327° +36° | 147° -36°   |           | -----       | -----     | -----       | -----      |                           |                     | X <sup>16</sup> | Lum+91         |                |
| EA                 | -----   | 325° +23° | —E—         | —E—       | -----       | -----     | -----       | 0.21409327 | 1.42                      | 1.10                |                 | DeA95          |                |
| L                  | -----   | 323° +35° | -----       | -----     | -----       | -----     | -----       | 0.21409321 | 1.4                       | 1.4 <sup>31</sup>   |                 | Ka+02a         |                |
| Synthesis          | -----   | 324° +31° | -----       | -----     | -----       | -----     | -----       | 0.2140932  | 1.4                       |                     |                 | Synthesis      |                |



| Basic data         | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                     |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                 | Albedo varieg.       | Reference code |
|--------------------|---|-----------|---------------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|-----------------|----------------------|----------------|
|                    | $\lambda_0$   | $\beta_0$ | $\lambda_0$         | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c             |                      |                |
| <b>40 Harmonia</b> |   |           |                     |           |             |           |             |           |                           |                   |                 |                      |                |
| A D                | Solution curve  |           |                     |           |             |           |             |           | -----                     | 1.31 <sup>2</sup> |                 |                      | Tan+91         |
| EAM                | -----   | 208° +21° | —E—                 | —E—       | -----       | -----     | -----       | 0.3712522 | 1.24                      | 2.07              |                 | Mic93                |                |
| EA                 | 22° +28°  | 203° +38° | -----               | -----     | -----       | -----     | -----       | 0.3711872 | 1.31                      | 1                 |                 | LGR99                |                |
| EA                 | 12° +34°  | 201° +41° | -----               | -----     | -----       | -----     | -----       | 0.3712535 | 1.31                      | 1                 |                 | LGR99                |                |
| Synthesis          | 17° +31°  | 204° +33° | -----               | -----     | -----       | -----     | -----       | 0.37123   | 1.3                       |                   |                 | Synthesis            |                |
| <b>41 Daphne</b>   |   |           |                     |           |             |           |             |           |                           |                   |                 |                      |                |
| AM                 | 15° +36°  | 157° +28° | 195° -36°           | 337° -28° | -----       | -----     | -----       | -----     | 1.51                      | 1.00              |                 | Bar83                |                |
| AM                 | 19° +35°  | 159° +32° | 199° -35°           | 339° -32° | -----       | -----     | -----       | -----     | 1.44                      | 1.0 <sup>1</sup>  |                 | Bar+85               |                |
| EA                 | —E—   | —E—       | 186° -40°           | 335° -33° | 0.2495001   | -----     | -----       | -----     | 1.30                      | 1.0               |                 | Mag86                |                |
| AM                 | 18° +48°  | 135° +43° | 198° -48°           | 315° -43° | -----       | -----     | -----       | -----     | 1.31                      | 1.16              |                 | Za+86b               |                |
| R                  | Concentric ring region <sup>6</sup>                             |           |                     |           |             |           |             |           | -----                     |                   |                 |                      | Ost87          |
| EAM                | —E—   | —E—       | -----               | 334° -32° | 0.2494996   | -----     | -----       | -----     | 1.28                      | 1.23              |                 | Dr+88b               |                |
| EA                 | —E—   | —E—       | 197° -36°           | 344° -38° | 0.2494994   | -----     | -----       | -----     | 1.28                      | 1.00              |                 | Mag90a               |                |
| EAM                | —E—   | —E—       | -----               | 340° -32° | 0.2494993   | -----     | -----       | -----     | 1.25                      | 1.19              |                 | Dru+91               |                |
| EA                 | —E—   | —E—       | 190° -27°           | 343° -31° | 0.24949931  | -----     | -----       | -----     | 1.37                      | 1.00              |                 | DeA95                |                |
| L                  | -----   | -----     | 196° -31°           | -----     | 0.2494993   | -----     | -----       | -----     | shape <sup>31</sup>       |                   |                 | Ka+02                |                |
| Synthesis          | -----   | -----     | 194° -31°           | 342° -34° | 0.2494994   | -----     | -----       | -----     | 1.3 1.1                   |                   |                 | Synthesis            |                |
| <b>42 Isis</b>     |   |           |                     |           |             |           |             |           |                           |                   |                 |                      |                |
| AM                 | 302° +36°   |           | 122° -36°           | -----     | -----       | -----     | -----       | -----     | 1.419                     | 1.000             |                 | Bla+98               |                |
| EAM                | —E—   | —E—       | 117° -5°            | 288° -16° | 0.5665417   | -----     | -----       | -----     | -----                     | -----             |                 | Den+98               |                |
| L                  | -----   | -----     | 120° -14°           | 294° -23° | 0.566542    | -----     | -----       | -----     | 1.1                       | 1.0 <sup>31</sup> |                 | Tor+03               |                |
| Synthesis          | -----   | -----     | 119° -18°           | 291° -20° | 0.566542    | -----     | -----       | -----     | 1.1                       | 1.0               |                 | Synthesis            |                |
| <b>43 Ariadne</b>  |   |           |                     |           |             |           |             |           |                           |                   |                 |                      |                |
| A                  | 73° +40°  | 249° +43° | 69° -43°            | 253° -40° | -----       | -----     | -----       | -----     | 1.69                      | 1.8 <sup>2</sup>  |                 | McC+84               |                |
| AM                 | 73° +25°  | 248° +20° | 68° -20°            | 253° -25° | -----       | -----     | -----       | -----     | 1.79                      | 1.10              |                 | Bar+86               |                |
| E                  | —E—   | —E—       | 55° -16°            | 241° -21° | 0.2400784   | -----     | -----       | -----     | -----                     | -----             |                 | Mic88                |                |
| EAM                | 78° +13°  | 256° +13° | —E—                 | —E—       | 0.2400924   | -----     | -----       | -----     | 1.40                      | 1.10              |                 | Dr+88b               |                |
| EA                 | —E—   | —E—       | 68° -14°            | 251° -16° | 0.2400828   | -----     | -----       | -----     | 1.76                      | 1.01              |                 | Mag90a               |                |
| EAM                | —E—   | —E—       | -----               | 248° -10° | 0.2400830   | -----     | -----       | -----     | 1.60                      | 1.24              |                 | Dru+91               |                |
| EA                 | —E—   | —E—       | -----               | 249° -14° | 0.2400817   | -----     | -----       | -----     | 1.59                      | 1.10              |                 | DeA92                |                |
| E                  | —E—   | —E—       | Retrograde rotation |           |             |           | -----       | -----     | -----                     | -----             | -----           |                      | Kru+92         |
| AMD                | 72° +13°  | 250° +8°  | 70° -8°             | 252° -13° | -----       | -----     | -----       | -----     | 1.84                      | 1.52              |                 | Det+92 <sup>25</sup> |                |
| EAMD               | -----   | 250° +1°  | 70° -1°             | -----     | -----       | -----     | -----       | -----     | 1.0 <sup>1</sup>          | 1.0 <sup>1</sup>  | X <sup>15</sup> | Det+92 <sup>25</sup> |                |
| EAMD               | 73° +25°  | 248° +20° | 68° -20°            | 253° -25° | -----       | -----     | -----       | -----     | shape <sup>14</sup>       |                   |                 | Det+92 <sup>25</sup> |                |
| EAMD               | 70° +5°   | -----     | -----               | 250° -5°  | -----       | -----     | -----       | -----     | shape <sup>14</sup>       |                   |                 | Det+92 <sup>25</sup> |                |
| E                  | —E—   | —E—       | 70° -22°            | 254° -24° | 0.24008258  | -----     | -----       | -----     | -----                     | -----             |                 | Det+92 <sup>25</sup> |                |
| EAM                | —E—   | —E—       | 68° -22°            | 253° -28° | 0.2400824   | -----     | -----       | -----     | 1.64                      | 1.16              |                 | Mic93                |                |
| EA                 | —E—   | —E—       | -----               | 249° -14° | 0.2400817   | -----     | -----       | -----     | 1.59                      | 1.10              |                 | DeA95                |                |
| EA                 | —E—   | —E—       | -----               | 251° -9°  | 0.2400824   | -----     | -----       | -----     | 1.68                      | 1.10              |                 | Dot+95               |                |
| E                  | —E—   | —E—       | 71° -25°            | 251° -25° | 0.2400818   | -----     | -----       | -----     | -----                     | -----             |                 | Sza+99               |                |
| L                  | -----   | -----     | -----               | 253° -15° | 0.24008275  | -----     | -----       | -----     | 1.6                       | 1.2 <sup>31</sup> |                 | Ka+02a               |                |
| Synthesis          | -----   | -----     | -----               | 252° -16° | 0.240082    | -----     | -----       | -----     | 1.6                       | 1.1               |                 | Synthesis            |                |

| Basic data        | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                |           |                    |           |             |                | Sidereal period<br>(days) | Ellipsoidal model |                     | Albedo varieg. | Reference code |
|-------------------|---|-----------|----------------|-----------|--------------------|-----------|-------------|----------------|---------------------------|-------------------|---------------------|----------------|----------------|
|                   | $\lambda_0$   | $\beta_0$ | $\lambda_0$    | $\beta_0$ | $\lambda_0$        | $\beta_0$ | $\lambda_0$ | $\beta_0$      |                           | a/b               | b/c                 |                |                |
| <b>44 Nysa</b>    |   |           |                |           |                    |           |             |                |                           |                   |                     |                |                |
| EA                |   |           | —E—            |           | 178°               | −84°      |             |                | 0.26737846                |                   | shape <sup>9</sup>  |                | Cai56          |
| AM                | 105°  | +30°      |                |           |                    |           | 285°        | −30°           | -----                     |                   |                     |                | Geh+62         |
| EA                |   |           | 358°           | +84°      | —E—                |           |             |                | 0.26730938                |                   |                     |                | Cha+62         |
| AM                | 100°  | +50°      |                |           |                    |           | 280°        | −50°           | -----                     | 1.58              | 1.30                |                | Zap+79         |
| E                 | 100°  | +60°      | 265°           | +55°      | —E—                |           | —E—         |                | 0.26755902                |                   |                     |                | Tay+83         |
| EA                | 94°   | +59°      | 288°           | +63°      | —E—                |           | —E—         |                | 0.26755895                |                   |                     |                | Mag83          |
| AM                | 99°   | +49°      | 295°           | +54°      | 115°               | −54°      | 279°        | −49°           | -----                     | 1.51              | 1.18                |                | Zap+84         |
| EAM               | 105°  | +57°      | 300°           | +61°      | —E—                |           | —E—         |                | 0.26755902                | 1.37              | 1.4                 |                | Mag86          |
| AMF               | 112°  | +46°      | 304°           | +47°      | 124°               | −47°      | 292°        | −46°           | -----                     |                   |                     |                | Lum+90         |
| EA                | 92°   | +47°      | 283°           | +49°      | —E—                |           | —E—         |                | 0.26755903                | 1.44              | 1.13                |                | DeA93          |
| L                 | 98°   | +58°      |                |           |                    |           |             |                | 0.26755904                |                   | shape <sup>31</sup> |                | Ka+02          |
| Synthesis         | 100°  | +53°      | 296°           | +52°      | —E—                |           | —E—         |                | 0.26755903                | 1.44              |                     |                | Synthesis      |
| <b>45 Eugenia</b> |   |           |                |           |                    |           |             |                |                           |                   |                     |                |                |
| E                 | —E—   |           | —E—            |           | 115°               | −34°      | 286°        | −26°           | 0.2374645                 |                   |                     |                | Tay+88         |
| EAM               | —E—   |           | —E—            |           | 127°               | −44°      |             |                | 0.2374646                 | 1.33              | 1.65                |                | Dr+88b         |
| EAM               | —E—   |           | —E—            |           | 125°               | −35°      | 296°        | −26°           | 0.2374646                 | 1.36              | 1.48                |                | Mag90a         |
| AMF               | 128°  | +16°      | 313°           | +25°      | 133°               | −25°      | 308°        | −16°           | -----                     |                   |                     |                | Lum+90         |
| A D               |   |           | Solution curve |           |                    |           |             |                | -----                     | 1.42 <sup>2</sup> |                     |                | Tan+91         |
| EA                | —E—   |           | —E—            |           | 109°               | −27°      |             |                | 0.2374650                 | 1.33              | 1.23                |                | DeA95          |
| EA                |   |           |                |           | check <sup>5</sup> |           |             |                | -----                     |                   |                     |                | Lag+95         |
| EA                |   |           |                |           | 106°               | −42°      | 313°        | −41°           | 0.2374644                 | 1.33              | 1.4                 |                | LGR99          |
| L                 |   |           |                |           | 124°               | −30°      |             |                | 0.23746429                | 1.4               | 1.5 <sup>31</sup>   |                | Ka+02a         |
| Synthesis         |   |           |                |           | 119°               | −34°      | 301°        | −27°           | 0.2374647                 | 1.36              | 1.5                 |                | Synthesis      |
| <b>47 Aglaja</b>  |   |           |                |           |                    |           |             |                |                           |                   |                     |                |                |
| EA                | 139°  | +33°      | 313°           | +19°      | —E—                |           | —E—         |                | 0.549549                  | 1.21              | 1.20                |                | Mic96a         |
| Synthesis         | 139°  | +33°      | 313°           | +19°      | —E—                |           | —E—         |                | 0.549549                  | 1.21              | 1.20                |                | Synthesis      |
| <b>48 Doris</b>   |   |           |                |           |                    |           |             |                |                           |                   |                     |                |                |
| AM                | 113°  | +27°      |                |           |                    |           | 293°        | −27°           | -----                     | 1.445             | 1.000               |                | Bla+98         |
| <b>51 Nemausa</b> |   |           |                |           |                    |           |             |                |                           |                   |                     |                |                |
| E F               | —E—   |           | —E—            |           | 133°               | −61°      |             | ? <sup>4</sup> | 0.324368                  |                   |                     |                | Kri91          |
| E F               | —E—   |           | —E—            |           | 166°               | −62°      |             | ? <sup>4</sup> | -----                     |                   |                     |                | Kri92          |
| EA                | 176°  | +62°      |                |           |                    |           | 356°        | −62°           | -----                     | 1.15              | 1.00                |                | DeA95          |
| E F               |   |           |                |           | 160°               | −68°      |             |                | 0.3242890                 |                   |                     |                | Kri97          |
| Synthesis         |   |           |                |           | 160°               | −64°      | 365°        | −62°           | 0.3243                    | 1.15              | 1.0                 |                | Synthesis      |
| <b>52 Europa</b>  |   |           |                |           |                    |           |             |                |                           |                   |                     |                |                |
| A                 | 0°  | +37°      | 203°           | +38°      | 23°                | −38°      | 180°        | −37°           | -----                     | 1.12              | 1.0 <sup>1</sup>    |                | Bar+86         |
| EAM               | 17°   | +65°      |                |           | —E—                |           | —E—         |                | -----                     | 1.11              | 2.79                |                | Mic93          |
| EA                | —E—   |           | —E—            |           | 80°                | −55°      | 250°        | −40°           | 0.2346504                 | 1.21              | 1.30                |                | Dot+95         |
| EAM               | —E—   |           | —E—            |           | 84°                | −32°      | 257°        | −18°           | 0.2347019                 | 1.20              | 1.17                |                | Mic+95         |
| EA                | 63°   | +46°      | 261°           | +60°      |                    |           |             |                | 0.2345855                 | 1.19              | 2.2                 |                | LGR99          |
| L                 |   |           |                |           | 79°                | −57°      | 246°        | −44°           | 0.23465042                | 1.2               | 1.2 <sup>31</sup>   |                | Ka+02a         |
| EAM               | 71°   | +31°      | 262°           | +46°      |                    |           |             |                | 0.2345813                 | 1.21              | 1.04                |                | Mic+04         |
| L                 | 67°   | +25°      | 254°           | +38°      |                    |           |             |                | 0.2345816                 | 1.15              | 1.3 <sup>31</sup>   |                | Mic+04         |
| Synthesis         | 69°   | +28°      | 258°           | +42°      | —E—                |           | —E—         |                | 0.2345815                 | 1.2               | 1.2                 |                | Synthesis      |

| Basic data          | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                   | Albedo varieg. | Reference code |
|---------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|-------------------|----------------|----------------|
|                     | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c               |                |                |
| <b>54 Alexandra</b> |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| A D                 | Solution curve  |           |             |           |             |           |             |           | -----                     | 1.3 <sup>2</sup>  |                   |                | Tan+91         |
| EA                  | 160° +45°   | 290° +55° | —E—         | —E—       |             |           |             |           | 0.292766                  |                   |                   |                | Bel+93         |
| L                   | ————  | 307° +20° | ————        | ————      |             |           |             |           | 0.292610                  |                   |                   |                | Tor+08         |
| L                   | ————  | ————      | 122° -36°   | 325° -37° |             |           |             |           | 0.292639                  |                   |                   |                | Tor+08         |
| <b>55 Pandora</b>   |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| AM                  | 36° +32°  | 226° +19° | 46° -19°    | 216° -32° |             |           |             |           | -----                     | 1.27              | 1.10              |                | Za+86b         |
| EAM                 | —E—   | —E—       | ————        | 202° -26° |             |           |             |           | 0.2001593                 | 1.76              | 1.52              |                | Dr+88b         |
| EAM                 | 32° +40°  | 224° +32° | —E—         | —E—       |             |           |             |           | 0.2001596                 | 1.34              | 1.47              |                | Dru+91         |
| EAM                 | ————  | 239° +28° | —E—         | —E—       |             |           |             |           | 0.2001595                 | 1.29              | 1.32              |                | Mic93          |
| EA                  | —E—   | —E—       | 50° -18°    | 216° -34° |             |           |             |           | 0.2001603                 | 1.29              | 1.25              |                | DeA95          |
| EA                  | 25° +30°  | 220° +30° | —E—         | —E—       |             |           |             |           | 0.2001686                 | 1.29              | 1.1               |                | Lag+95         |
| EAM                 | 28° +48°  | 232° +42° | —E—         | —E—       |             |           |             |           | 0.2001685                 | 1.32              | 1.25              |                | Mic96a         |
| L                   | ————  | 225° +10° | ————        | ————      |             |           |             |           | 0.2001685                 | 1.2               | 1.2 <sup>31</sup> |                | Tor+03         |
| Synthesis           | 30° +38°  | 228° +27° | ————        | ————      |             |           |             |           | 0.2001685                 | 1.25              | 1.2               |                | Synthesis      |
| <b>60 Echo</b>      |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| EAM                 | 95° +34°  | 275° +42° | —E—         | —E—       |             |           |             |           | 1.048226                  | 1.50 <sup>2</sup> | 1.38              |                | Mic93          |
| Synthesis           | 95° +34°  | 275° +42° | —E—         | —E—       |             |           |             |           | 1.048226                  | 1.5               | 1.4               |                | Synthesis      |
| <b>63 Ausonia</b>   |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| AM                  | 130°  | 310°      | 130°        | 310°      |             |           |             |           | -----                     | 2.4               | 1.0               |                | Zap+83         |
| AM                  | 127° +38°   | 298° +28° | 118° -28°   | 307° -38° |             |           |             |           | -----                     | 2.25              | 1.0 <sup>1</sup>  |                | Zap+84         |
| EAM                 | —E—   | —E—       | 120° -30°   | 305° -30° |             |           |             |           | 0.3873987                 | 2.06              | 1.04              |                | Mag86          |
| E                   | —E—   | —E—       |             |           |             |           |             |           | 0.387230                  |                   |                   |                | Lu+87a         |
| EA                  | —E—   | —E—       |             | 313° -42° |             |           |             |           | 0.3873992                 | 2.16              | 1.04              |                | DeA95          |
| EAM                 | —E—   | —E—       | 122° -26°   | 310° -40° |             |           |             |           | 0.3874027                 | 2.08              | 1.05              |                | Mic96a         |
| AM                  |   | 305° +36° | 125° -36°   |           |             |           |             |           | -----                     | 2.39              | 1.00              |                | Bla+00         |
| L                   | ————  | ————      | 120° -15°   | 304° -22° |             |           |             |           | 0.3873995                 | 1.9               | 1.0 <sup>31</sup> |                | Tor+03         |
| Synthesis           | —E—   | —E—       | 120° -27°   | 308° -34° |             |           |             |           | 0.3874027                 | 2.1               | 1.0               |                | Synthesis      |
| <b>64 Angelina</b>  |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| EAM                 | 119° +29°   | 299° +27° | —E—         | —E—       |             |           |             |           | 0.3647784                 | 1.38              | 1.05              |                | Mic93          |
| Synthesis           | 119° +29°   | 299° +27° | —E—         | —E—       |             |           |             |           | 0.3647784                 | 1.4               | 1                 |                | Synthesis      |
| <b>65 Cybele</b>    |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| EAM                 | —E—   | —E—       | 26° -52°    | ————      |             |           |             |           | 0.1661266                 | 1.08              | 1.74              |                | Dr+88b         |
| EAM                 | —E—   | —E—       | 25° -49°    | ————      |             |           |             |           | 0.1683549                 | 1.09              | 1.69              |                | Dru+91         |
| EA                  | —E—   | —E—       | 34° -23°    |           |             |           |             |           | 0.1683552                 | 1.05              | 1.37              |                | DeA95          |
| Synthesis           | —E—   | —E—       | 28° -41°    |           |             |           |             |           | 0.1683551                 | 1.07              |                   |                | Synthesis      |
| <b>66 Maja</b>      |   |           |             |           |             |           |             |           |                           |                   |                   |                |                |
| AM                  |   | 345° +50° | 165° -50°   |           |             |           |             |           | -----                     | 1.660             | 1.000             |                | Bla+98         |
| AM                  | 156° +62°   |           |             | 336° -62° |             |           |             |           | -----                     | 1.66              | 1.40              |                | Bla+00         |

| Basic data         | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                                     |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code       |       |
|--------------------|---|-----------|-------------------------------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------------|-------|
|                    | $\lambda_0$   | $\beta_0$ | $\lambda_0$                         | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                      |       |
| <b>69 Hesperia</b> |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| E                  | 131°  | +42°      | 315°                                | +59°      | —E—         | —E—       |             |           | 0.2358226                 |                     |                   |                | Ve+89b               |       |
| E                  |   |           |                                     |           | —E—         | —E—       |             |           | -----                     |                     |                   |                | Kru+92               |       |
| EA                 |   |           | 243°                                | +51°      | —E—         | —E—       |             |           | 0.2356040                 | 1.25                | 1.45              |                | DeA+95               |       |
| AM                 | 64°   | +39°      | 250°                                | +42°      | 70°         | -42°      | 244°        | -39°      | -----                     | 1.247               | 1.250             |                | Bla+98               |       |
| L                  | ————  | ————      |                                     |           | 73°         | -45°      | ————        |           | 0.2356333                 | 1.1                 | 1.4 <sup>31</sup> |                | Tor+03               |       |
| <b>71 Niobe</b>    |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| AM                 |   |           | 274°                                | +14°      | 94°         | -14°      |             |           | -----                     | 1.202               | 1.345             |                | Bla+98               |       |
| <b>73 Klytia</b>   |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| L                  | 38°   | +75°      | 237°                                | +73°      | ————        | ————      |             |           | 0.3451277                 | shape <sup>31</sup> |                   |                | Mar+08               |       |
| Synthesis          | 38°   | +75°      | 237°                                | +73°      | ————        | ————      |             |           | 0.3451277                 | shape <sup>31</sup> |                   |                | Synthesis            |       |
| <b>75 Eurydike</b> |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| EAM                |   |           | 253°                                | +30°      |             |           |             |           | 0.2231746                 | 1.19                | 1.60              |                | Tun+02               |       |
| <b>77 Frigga</b>   |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| AM                 | 57°   | +39°      |                                     |           |             |           | 236°        | -40°      | -----                     | 1.224               | 1.010             |                | Bla+98               |       |
| <b>79 Eurynome</b> |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| EA                 | 64°   | +45°      | 226°                                | +52°      | —E—         | —E—       |             |           | 0.2490706                 | 1.28                | 2.0 <sup>2</sup>  |                | Mi+90a <sup>24</sup> |       |
| EA                 | 62°   | +26°      | 226°                                | +41°      | —E—         | —E—       |             |           | 0.2490708                 | 1.24                | 1.20              |                | DeA93                |       |
| EA                 | 56°   | +28°      | 236°                                | +38°      | —E—         | —E—       |             |           | 0.2490705                 | 1.25                | 1.42              |                | DeA+95               |       |
| EAM                | 40°   | +35°      | 214°                                | +38°      | —E—         | —E—       |             |           | 0.2490716                 | 1.22                | 1.22              |                | Mic96a               |       |
| E                  | —E—   | —E—       |                                     |           | 65°         | -36°      | 245°        | -36°      | 0.2490706                 |                     |                   |                | Sza+99               |       |
| L                  | 64°   | +15°      | ————                                | ————      | ————        | ————      |             |           | 0.2491071                 | shape <sup>31</sup> |                   |                | Tor+08               |       |
| Synthesis          | 55°   | 25°       | ————                                | ————      | ————        | ————      |             |           | 0.2491071                 | 1.2                 | 1.3               |                | Synthesis            |       |
| <b>80 Sappho</b>   |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| R                  |   |           | Concentric ring region <sup>6</sup> |           |             |           |             |           |                           | -----               |                   |                |                      | Ost87 |
| L                  | ————  | ————      |                                     |           | 6°          | -16°      | 194°        | -26°      | 0.584620                  | shape <sup>31</sup> |                   |                | Dur+09               |       |
| Synthesis          | ————  | ————      |                                     |           | 6°          | -16°      | 194°        | -26°      | 0.584620                  | shape <sup>31</sup> |                   |                | Synthesis            |       |
| <b>82 Alkmene</b>  |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| L                  | ————  | ————      |                                     |           | 164°        | -34°      | 351°        | -39°      | 0.541699                  | shape <sup>31</sup> |                   |                | Dur+09               |       |
| Synthesis          | ————  | ————      |                                     |           | 164°        | -34°      | 351°        | -39°      | 0.541699                  | shape <sup>31</sup> |                   |                | Synthesis            |       |
| <b>83 Beatrix</b>  |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| EAM                | —E—   | —E—       |                                     |           | 3°          | -37°      | 172°        | -31°      | 0.4213796                 | 1.26                | 1.16              |                | Kru+94               |       |
| EA                 | —E—   | —E—       |                                     |           | 6°          | -46°      | 173°        | -38°      | -----                     | 1.22                | 1.10              |                | DeA95                |       |
| Synthesis          | —E—   | —E—       |                                     |           | 4°          | -42°      | 172°        | -34°      | 0.4213796                 | 1.24                | 1.1               |                | Synthesis            |       |

| Basic data         | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code |
|--------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------|
|                    | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                |
| <b>85 Io</b>       |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EA                 | 120°  | +89°      | 303°        | +82°      | 123°        | -82°      | 300°        | -89°      | -----                     | 1.18                | 1.00              |                | Dot+95         |
| EAM <sup>32</sup>  | —E—   |           | —E—         |           | —E—         |           | 285°        | -52°      | 0.28646325                | 1.15                | 1.8               |                | Eri+99         |
| EAM <sup>32</sup>  | —E—   |           | —E—         |           | 108°        | -46°      | 290°        | -16°      | 0.2864629                 | 1.19                |                   |                | Eri+99         |
| L                  | —   |           | —           |           | 105°        | -45°      | 295°        | -14°      | 0.2864629                 | 1.1                 | 1.0 <sup>31</sup> |                | Tor+03         |
| Synthesis          | —   |           | —           |           | 106°        | -46°      | 293°        | -15°      | 0.28646325                | 1.1                 | 1.0               |                | Synthesis      |
| <b>87 Sylvia</b>   |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                | 89°   | +52°      | 288°        | +40°      | —E—         |           | —E—         |           | 0.2159852                 | 1.41                | 1.17              |                | Dr+88b         |
| EAM                | 66°   | +67°      | 296°        | +59°      | —E—         |           | —E—         |           | 0.2159851                 | 1.44                | 1.5               |                | Mag90a         |
| EAM                | 89°   | +52°      | 291°        | +42°      | —E—         |           | —E—         |           | 0.2159853                 | 1.43                | 1.17              |                | Dru+91         |
| EAM                | 84°   | +55°      | 297°        | +50°      | —E—         |           | —E—         |           | 0.2159859                 | 1.37                | 1.41 <sup>2</sup> |                | Mic93          |
| EA                 | 86°   | +45°      |             |           | —E—         |           | —E—         |           | 0.2159850                 | 1.45                | 1.05              |                | DeA95          |
| L                  | 71°   | +66°      | —           |           | —           |           | —           |           | 0.21598508                | 1.4                 | 1.1 <sup>31</sup> |                | Ka+02a         |
| S                  | 96°   | +39°      | —           |           | —           |           | —           |           | -----                     | 1.33                | 1.16              |                | Dru+08         |
| Synthesis          | 84°   | +52°      | —           |           | —           |           | —           |           | 0.2159853                 | 1.40                | 1.2               |                | Synthesis      |
| <b>88 Thisbe</b>   |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| AM                 | 32°   | +69°      | 205°        | +54°      | 25°         | -54°      | 212°        | -69°      | -----                     | 1.13                | 1.0 <sup>1</sup>  |                | Za+86b         |
| EAM                | —   |           | 129°        | +78°      | —E—         |           | —E—         |           | 0.2517222                 | 1.12                | 1.30              |                | Dr+88b         |
| EA                 | 40°   | +70°      | 200°        | +70°      | —E—         |           | —E—         |           | 0.2517223                 | 1.13                |                   |                | Mag90a         |
| EAM                | —   |           | 110°        | +58°      | —E—         |           | —E—         |           | 0.2517222                 | 1.15                | 1.16              |                | Dru+91         |
| EA                 | —   |           | 243°        | +74°      | —E—         |           | —E—         |           | 0.2517224                 | 1.11                | 1.22              |                | DeA95          |
| L                  | —   |           | 207°        | +48°      | —           |           | —           |           | 0.2517208                 | 1.1                 | 1.2 <sup>31</sup> |                | Tor+03         |
| Synthesis          | —   |           | 190°        | +64°      | —           |           | —           |           | 0.25172                   | 1.1                 | 1.2               |                | Synthesis      |
| <b>93 Minerva</b>  |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EA                 | —   |           | 203°        | +15°      | —           |           | —           |           | 0.249087                  | 1.07                | 1.10              |                | Eri00          |
| EAM                | —   |           | 189°        | +10°      | —           |           | —           |           | 0.2491288                 | 1.12                | 1.00              |                | Tun+02         |
| L                  | —   |           | 216°        | +21°      | —           |           | —           |           | 0.249303                  | shape <sup>31</sup> |                   |                | Tor+08         |
| L                  | —   |           | —           |           | 49°         | -40°      | —           |           | 0.249297                  | shape <sup>31</sup> |                   |                | Tor+08         |
| Synthesis          | —   |           | 203°        | +15°      | —           |           | —           |           | 0.2493                    | 1.10                | 1.05              |                | Synthesis      |
| <b>97 Klotho</b>   |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                | —   |           | 340°        | +8°       | —           |           | —           |           | 1.4632286                 | 1.33                | 1.10              |                | Tun+02         |
| <b>105 Artemis</b> |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                | —   |           | 192°        | +68°      | —           |           | —           |           | 0.7729158                 | 1.09                | 1.53              |                | Tun+02         |
| <b>107 Camilla</b> |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                | 71°   | +61°      | 233°        | +74°      | —E—         |           | —E—         |           | 0.2018306                 | 1.45                | 1.72              |                | Dr+88b         |
| EAM                | 74°   | +55°      | 239°        | +76°      | —E—         |           | —E—         |           | 0.2018305                 | 1.46                | 1.6               |                | Mag90a         |
| EAM                | —   |           | 229°        | +73°      | —E—         |           | —E—         |           | 0.2018305                 | 1.47                | 1.49              |                | Dru+91         |
| EA                 | —   |           | 230°        | +69°      | —E—         |           | —E—         |           | 0.2018307                 | 1.46                | 1.58              |                | DeA95          |
| L                  | 72°   | +51°      | —           |           | —           |           | —           |           | 0.2018304                 | 1.4                 | 1.2               |                | Tor+03         |
| Synthesis          | 72°   | +56°      | 232°        | +74°      | —           |           | —           |           | 0.2018306                 | 1.46                | 1.6               |                | Synthesis      |

| Basic data            | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code |
|-----------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------|
|                       | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                |
| <b>108 Hecuba</b>     |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| AM                    | 79°   | +13°      |             |           |             |           | 259°        | -13°      | -----                     | 1.180               | 1.101             |                | Bla+98         |
| AM                    | 79°   | +6°       |             |           |             |           | 259°        | -6°       | -----                     | 1.180               | 1.101             |                | Bla+98         |
| <b>110 Lydia</b>      |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                   | 24°   | +75°      | 210°        | +78°      |             |           |             |           | -----                     | 1.17                |                   |                | Mic96a         |
| L                     | -----   | -----     | -----       | -----     | 149°        | -55°      | 331°        | -61°      | 0.4552416                 | shape <sup>31</sup> |                   |                | Dur+07         |
| Synthesis             | -----   | -----     | -----       | -----     | 149°        | -55°      | 331°        | -61°      | 0.4552416                 | shape <sup>31</sup> |                   |                | Synthesis      |
| <b>113 Amalthea</b>   |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                   |   |           |             |           | 70°         | -18°      |             |           | 0.4140702                 | 1.45                | 1.17              |                | Tun+02         |
| <b>115 Thyra</b>      |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EA                    | 175°  | +60°      | 330°        | +60°      | —E—         |           | —E—         |           | 0.301565                  | 1.14                | 1.30              |                | Dot+95         |
| AM                    | 197°  | +30°      | 358°        | +35°      | 17°         | -30°      | 178°        | -35°      | -----                     | 1.224               | 1.088             |                | Bla+98         |
| EAM                   | -----   | -----     | -----       | -----     | -----       | -----     | 182°        | -43°      | 0.3017940                 | 1.21                | 1.03              |                | Mic+03         |
| EAM                   | 7°  | +34°      | -----       | -----     | -----       | -----     | -----       | -----     | 0.3017257                 | 1.23                | 1.03              |                | Mic+04         |
| L                     | 23°   | +33°      | -----       | -----     | -----       | -----     | -----       | -----     | 0.3016652                 | 1.1                 | 1.1 <sup>31</sup> |                | Mic+04         |
| Synthesis             | 15°   | +34°      | -----       | -----     | -----       | -----     | -----       | -----     | 0.30169                   | 1.2                 | 1                 |                | Synthesis      |
| <b>119 Althaea</b>    |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                   |   |           |             |           | 21°         | -77°      |             |           | 0.4783486                 | 1.29                | 1.33              |                | Tun+02         |
| L                     | -----   | -----     | -----       | -----     |             | -62°      |             | -62°      | 0.477713                  |                     |                   |                | Dur+09         |
| <b>121 Hermione</b>   |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EA                    | 163°  | +12°      | 342°        | +30°      | 162°        | -30°      | 343°        | -12°      | -----                     | 1.10                | 1.00              |                | DeA95          |
| AM                    | 40°   | +32°      |             |           |             |           | 220°        | -32°      | -----                     | 1.294               | 1.288             |                | Bla+96         |
| AM                    |   |           | 240°        | +42°      | 60°         | -42°      |             |           | -----                     | 1.294               | 1.393             |                | Bla+98         |
| <b>122 Gerda</b>      |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| AM                    | 26°   | +31°      |             |           |             |           | 190°        | -39°      | -----                     | 1.21                | 0.94              |                | She+09         |
| <b>125 Liberatrix</b> |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                   | 80°   | +74°      | -----       | -----     | —E—         |           | —E—         |           | 0.1653422                 | 1.28                | 2.68              |                | Dr+88b         |
| E                     |   | +70°      |             | +70°      | —E—         |           | —E—         |           | 0.1653425                 |                     |                   |                | Mag90a         |
| EAM                   | -----   | -----     | 228°        | +71°      | —E—         |           | —E—         |           | 0.1653420                 | 1.35                | 1.23              |                | Dru+91         |
| EA                    | 15°   | +47°      | 181°        | +53°      | —E—         |           | —E—         |           | 0.1653418                 | 1.55                | 1.10              |                | DeA95          |
| L                     | 95°   | +68°      | 280°        | +74°      | -----       | -----     | -----       | -----     | 0.1653416                 | shape <sup>31</sup> |                   |                | Dur+07         |
| Synthesis             | 95°   | +68°      | 280°        | +74°      | -----       | -----     | -----       | -----     | 0.1653416                 | shape <sup>31</sup> |                   |                | Synthesis      |

| Basic data          | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code       |        |
|---------------------|---|-----------|----------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------------|--------|
|                     | $\lambda_0$   | $\beta_0$ | $\lambda_0$    | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                      |        |
| <b>129 Antigone</b> |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| AM                  | 331° +30°   | 133° +48° | 313° -48°      | 151° -30° | -----       | -----     | -----       | -----     | -----                     | 1.37                | 1.0 <sup>1</sup>  |                | Bar+85               |        |
| EA                  | 20° +50°  | 180° +72° | —E—            | —E—       | -----       | -----     | -----       | -----     | 0.2065566                 | 1.27                | 1.0               |                | Mag86                |        |
| EAM                 | -----   | 196° +64° | —E—            | —E—       | -----       | -----     | -----       | -----     | 0.2065486                 | 1.27                | 1.05              |                | Dr+88b               |        |
| EA                  | 38° +27°  | 202° +53° | —E—            | —E—       | -----       | -----     | -----       | -----     | 0.2065485                 | 1.32                | 1.02              |                | Mag90a               |        |
| EAM                 | -----   | 195° +65° | —E—            | —E—       | -----       | -----     | -----       | -----     | 0.2065486                 | 1.23                | 1.07              |                | Dru+91               |        |
| AM                  | 42° +36°  | 208° +68° | 18° -68°       | 222° -36° | -----       | -----     | -----       | -----     | -----                     | 1.45                | 1.05              |                | Dot+92               |        |
| EA                  | -----   | 194° +72° | —E—            | —E—       | -----       | -----     | -----       | -----     | 0.2065483                 | 1.32                | 1.01              |                | DeA95                |        |
| L                   | -----   | 207° +58° | -----          | -----     | -----       | -----     | -----       | -----     | 0.2065480                 | 1.3                 | 1.0 <sup>31</sup> |                | Tor+03               |        |
| S                   | -----   | 202° +52° | -----          | -----     | -----       | -----     | -----       | -----     | -----                     | 1.22                | 1.48              |                | Dru+09               |        |
| Synthesis           | -----   | 204° +55° | -----          | -----     | -----       | -----     | -----       | -----     | 0.2065484                 | 1.3                 | 1.1               |                | Synthesis            |        |
| <b>130 Elektra</b>  |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| EAM                 | —E—   | —E—       | 190° -81°      | -----     | -----       | -----     | -----       | -----     | 0.2176951                 | 1.29                | 1.63              |                | Dr+88b               |        |
| EAM                 | —E—   | —E—       | 180° -85°      | 240° -40° | -----       | -----     | -----       | -----     | 0.2176942                 | 1.41                | 1.2               |                | Mag90a               |        |
| EAM                 | —E—   | —E—       | 344° -86°      | 246° -32° | -----       | -----     | -----       | -----     | 0.2176942                 | 1.32                | 1.06              |                | Mic93                |        |
| EA                  | —E—   | —E—       | 192° -83°      | -----     | -----       | -----     | -----       | -----     | 0.2176950                 | 1.55                | 1.45              |                | DeA95                |        |
| L                   | -----   | -----     | 65° -88°       | -----     | -----       | -----     | -----       | -----     | 0.2176943                 | shape <sup>31</sup> |                   |                | Dur+07               |        |
| L                   | -----   | -----     | 160° -85°      | -----     | -----       | -----     | -----       | -----     | 0.2176942                 | shape <sup>31</sup> |                   |                | Tor+08               |        |
| Synthesis           | -----   | -----     | 160° -85°      | -----     | -----       | -----     | -----       | -----     | 0.2176942                 | 1.2                 | 1.1               |                | Synthesis            |        |
| <b>132 Aethra</b>   |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| L                   | -----   | 337° +70° | -----          | -----     | -----       | -----     | -----       | -----     | 0.2153448                 | shape <sup>31</sup> |                   |                | Dur+09               |        |
| Synthesis           | -----   | 337° +70° | -----          | -----     | -----       | -----     | -----       | -----     | 0.2153448                 | shape <sup>31</sup> |                   |                | Synthesis            |        |
| <b>133 Cyrene</b>   |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| E                   | Prograde rotation   | -----     | —E—            | —E—       | -----       | -----     | -----       | -----     | 0.5295                    |                     |                   |                | Har+84               |        |
| <b>135 Hertha</b>   |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| A D                 |   |           | Solution curve |           |             |           | -----       | -----     | -----                     | -----               | 1.23              |                |                      | Tan+91 |
| AM                  | 135° +46°   | 310° +43° | 130° -43°      | 315° -46° | -----       | -----     | -----       | -----     | -----                     | 1.34                | 1.22              |                | Dot+92 <sup>22</sup> |        |
| EAM                 | —E—   | —E—       | 126° -28°      | 310° -31° | -----       | -----     | -----       | -----     | 0.347818                  | 1.36                | 1.20              |                | Mic93                |        |
| EA                  | 106° +2°  | -----     | -----          | 286° -2°  | -----       | -----     | -----       | -----     | 0.350238                  | 1.16                | 1.14              |                | Lag+95               |        |
| EAM                 | 118° +52°   | 291° +47° | -----          | -----     | -----       | -----     | -----       | -----     | -----                     | 1.25                | 1.24              |                | Mic96a               |        |
| L                   | 96° +58°  | 274° +53° | -----          | -----     | -----       | -----     | -----       | -----     | 0.350025                  | 1.1                 | 1.4 <sup>31</sup> |                | Tor+03               |        |
| Synthesis           | 100° +52°   | 292° +50° | -----          | -----     | -----       | -----     | -----       | -----     | 0.350238                  | 1.15                | 1.2               |                | Synthesis            |        |
| <b>136 Austria</b>  |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| L                   | +63°  | +63°      | -----          | -----     | -----       | -----     | -----       | -----     | 0.479025                  |                     |                   |                | Dur+09               |        |
| <b>137 Meliboea</b> |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| AM                  | 149° +8°  | -----     | -----          | 329° -8°  | -----       | -----     | -----       | -----     | -----                     | 1.18                | 1.11              |                | Bla+00               |        |
| <b>139 Juewa</b>    |   |           |                |           |             |           |             |           |                           |                     |                   |                |                      |        |
| EAM                 | 117° +50°   | -----     | —E—            | —E—       | -----       | -----     | -----       | -----     | -----                     | 1.21                | 1.68              |                | Mic93                |        |

| Basic data         | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model     |     | Albedo varieg. | Reference code |
|--------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-----------------------|-----|----------------|----------------|
|                    | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                   | b/c |                |                |
| <b>144 Vibia</b>   |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| R                  | Concentric ring region <sup>6</sup>                             |           |             |           |             |           |             |           | -----                     |                       |     |                | Ost87          |
| <b>146 Lucina</b>  |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| L                  | -----   | -----     | 139°        | -14°      | 305°        | -41°      |             |           | 0.773082                  | shape <sup>31</sup>   |     | Dur+09         |                |
| Synthesis          | -----   | -----     | 139°        | -14°      | 305°        | -41°      |             |           | 0.773082                  | shape <sup>31</sup>   |     | Synthesis      |                |
| <b>150 Nuwa</b>    |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| AM                 |   |           | 253°        | +1°       | 73°         | -1°       |             |           | -----                     | 1.116 1.043           |     | Bla+96         |                |
| AM                 |   |           | 257°        | +1°       | 77°         | -1°       |             |           | -----                     | 1.097 1.015           |     | Bla+98         |                |
| AM                 |   |           | 253°        | +27°      | 73°         | -27°      |             |           | -----                     | 1.097 1.015           |     | Bla+98         |                |
| <b>152 Atala</b>   |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| L                  | 199°  | +62°      | 347°        | +47°      | -----       | -----     |             |           | 0.260197                  | shape <sup>31</sup>   |     | Dur+09         |                |
| Synthesis          | 199°  | +62°      | 347°        | +47°      | -----       | -----     |             |           | 0.260197                  | shape <sup>31</sup>   |     | Synthesis      |                |
| <b>153 Hilda</b>   |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| AM                 | 149°  | +29°      |             |           |             |           | 329°        | -32°      | -----                     | 1.19 1.32             |     | She+09         |                |
| <b>158 Koronis</b> |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| EAM                | -----   | -----     | 19°         | -69°      | 201°        | -72°      |             |           | 0.5919043                 | 1.5 1.7               |     | Sli+03         |                |
| L                  | -----   | -----     | 35°         | -65°      | 220°        | -68°      |             |           | 0.5919038                 | 1.4 1.5               |     | Sli+03         |                |
| Synthesis          | -----   | -----     | 27°         | -67°      | 211°        | -70°      |             |           | 0.5919042                 | 1.5 1.6               |     | Synthesis      |                |
| <b>160 Una</b>     |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| L                  | -----   | -----     | 125°        | -33°      | 308°        | -41°      |             |           | 0.4597157                 | shape <sup>31</sup>   |     | Mar+09         |                |
| Synthesis          | -----   | -----     | 125°        | -33°      | 308°        | -41°      |             |           | 0.4597157                 | shape <sup>31</sup>   |     | Synthesis      |                |
| <b>161 Athor</b>   |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| AM                 | 1°  | +48°      | 209°        | +47°      | 29°         | -47°      | 181°        | -48°      | -----                     | 1.367 0.850           |     | Bla+98         |                |
| <b>165 Loreley</b> |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| AM                 |   |           | 339°        | +65°      | 159°        | -65°      |             |           | -----                     | 1.191 1.274           |     | Bla+98         |                |
| L                  | -----   |           | 346°        | +29°      | -----       | -----     |             |           | 0.3011112                 | shape <sup>31</sup>   |     | Dur+07         |                |
| Synthesis          | -----   |           | 346°        | +29°      | -----       | -----     |             |           | 0.3011112                 | shape <sup>31</sup>   |     | Synthesis      |                |
| <b>167 Urda</b>    |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| EAM                | -----   | -----     | 30°         | -73°      | 220°        | -69°      |             |           | 0.5442240                 | 1.3 1.0               |     | Sli+03         |                |
| L                  | -----   | -----     | 40°         | -75°      | 225°        | -73°      |             |           | 0.5442238                 | 1.2 1.0               |     | Sli+03         |                |
| Synthesis          | -----   | -----     | 39°         | -74°      | 225°        | -71°      |             |           | 0.5442242                 | 1.3 1.0               |     | Synthesis      |                |
| <b>173 Ino</b>     |   |           |             |           |             |           |             |           |                           |                       |     |                |                |
| EAM                | —E—   | —E—       | 198°        | -21°      | 356°        | -47°      |             |           | -----                     | 1.23 1.69             |     | Mic93          |                |
| EA                 | —E—   | —E—       | 186°        | -22°      | 365°        | -21°      |             |           | -----                     | 1.12 1.06             |     | DeA95          |                |
| L                  | -----   | -----     | 178°        | -14°      | 344°        | -30°      |             |           | 0.2548546                 | 1.1 1.1 <sup>31</sup> |     | Mic+05         |                |
| Synthesis          | -----   | -----     | 178°        | -14°      | 344°        | -30°      |             |           | 0.2548546                 | 1.1 1.1               |     | Synthesis      |                |



| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                     | Albedo varieg. | Reference code |
|----------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|---------------------|----------------|----------------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c                 |                |                |
| <b>176 Iduna</b>     |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| AM                   | 85°   | +36°      |             |           |             |           | 265°        | -36°      | -----                     | 1.39              | 1.28                |                | Bla+00         |
| <b>182 Elsa</b>      |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| L                    | -----   | -----     |             |           | 72°         | -84°      | 224°        | -82°      | 3.3403                    |                   | shape <sup>31</sup> |                | Dur+09         |
| <b>184 Dejopeja</b>  |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| L                    | 18°   | +54°      | 201°        | +52°      | -----       | -----     |             |           | 0.2683796                 |                   | shape <sup>31</sup> |                | Mar+07         |
| L                    | 14°   | +51°      | 196°        | +50°      | -----       | -----     |             |           | 0.2683799                 |                   | shape <sup>31</sup> |                | Dur+09         |
| Synthesis            | 16°   | +53°      | 198°        | +51°      | -----       | -----     |             |           | 0.2683797                 |                   | shape <sup>31</sup> |                | Synthesis      |
| <b>190 Ismene</b>    |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| AM                   | 118°  | +23°      |             |           |             |           | 298°        | -30°      | -----                     | 1.13              | 1.21                |                | She+09         |
| <b>192 Nausikaa</b>  |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| A                    | 130°  | +40°      |             |           |             |           | 310°        | -40°      | -----                     |                   |                     |                | Sc+76a         |
| EA                   | —E—   | —E—       | —E—         | —E—       | -----       | -----     | 325°        | -45°      | 0.567670                  | 1.35              | 1.50                |                | Dot+95         |
| L                    | 131°  | +36°      | -----       | -----     | -----       | -----     | 306°        | -7°       | 0.5676058                 | 1.3               | 1.1 <sup>31</sup>   |                | Ka+02a         |
| <b>196 Philomela</b> |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| EAM                  | 78°   | +26°      | 266°        | +24°      | 86°         | -24°      | 258°        | -26°      | -----                     | 1.58              | 1.06                |                | Mic92          |
| EAM                  | —E—   | —E—       | —E—         | —E—       | 99°         | -16°      | 273°        | -22°      | -----                     | 1.33              | 1.17                |                | Mic93          |
| A D                  | 102°  | +26°      | 287°        | +26°      | 107°        | -26°      | 282°        | -26°      | -----                     | 1.50              |                     |                | Lic+94         |
| EA                   | 105°  | +20°      |             |           |             |           | 285°        | -20°      | -----                     | 1.40              | 1.00                |                | DeA95          |
| EAM                  | -----   | -----     | 277°        | +20°      | —E—         | —E—       |             |           | 0.3475556 <sup>2</sup>    | 1.32              | 1.16                |                | Kry+96         |
| AM                   |   |           | 278°        | +20°      | 98°         | -20°      |             |           | -----                     | 1.472             | 0.914               |                | Bla+98         |
| L                    | -----   | -----     | 111°        | -41°      | 276°        | -49°      |             |           | 0.3472011                 |                   | shape <sup>31</sup> |                | Dur+07         |
| Synthesis            | -----   | -----     | 111°        | -41°      | 276°        | -49°      |             |           | 0.3475556                 | 1.3               | 1.2                 |                | Synthesis      |
| <b>201 Penelope</b>  |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| EAM                  | 78°   | -3°       | 258°        | +4°       |             |           |             |           | 0.1561283 <sup>2</sup>    | 1.47              | 1.22                |                | Dr+88b         |
| EAM                  | —E—   | —E—       | —E—         | —E—       | 80°         | -35°      | 260°        | -25°      | 0.1561443                 | 1.50              | 1.23                |                | Mag90a         |
| EAM                  | 74°   | -2°       | -----       | -----     |             |           |             |           | 0.1561287                 | 1.53              | 1.24                |                | Dru+91         |
| EAM                  |   |           |             |           |             |           | 261°        | -34°      | 0.1561440                 | 1.55              | 1.34                |                | Dru+91         |
| EAM                  | —E—   | —E—       | —E—         | —E—       | 85°         | -40°      | 260°        | -25°      | 0.1561439                 | 1.42              | 1.3                 |                | Eri+93         |
| EAM                  | —E—   | —E—       | —E—         | —E—       |             |           | 258°        | -22°      | 0.1561433                 | 1.32              | 1.06                |                | Mic93          |
| EA                   | —E—   | —E—       | —E—         | —E—       | 93°         | -14°      |             |           | 0.15614438                | 1.65              | 1.20                |                | DeA95          |
| EAM                  | —E—   | —E—       | —E—         | —E—       | 84°         | -39°      | 260°        | -20°      | 0.1561439                 | 1.49              | 1.20                |                | Mic96a         |
| EAM                  |   |           |             |           | 84°         | -32°      |             |           | 0.1561401                 | 1.51              | 1.24                |                | Tun+02         |
| L                    | -----   | -----     | 84°         | -15°      | 262°        | -1°       |             |           | 0.1561439                 | 1.5               | 1.1 <sup>31</sup>   |                | Tor+03         |
| Synthesis            | —E—   | —E—       | 85°         | -29°      | 260°        | -21°      |             |           | 0.1561439                 | 1.5               | 1.2                 |                | Synthesis      |

| Basic data            | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |                     |                   |           | Sidereal period<br>(days) | Ellipsoidal model |     | Albedo varieg. | Reference code |
|-----------------------|---|-----------|-------------|-----------|-------------|---------------------|-------------------|-----------|---------------------------|-------------------|-----|----------------|----------------|
|                       | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$           | $\lambda_0$       | $\beta_0$ |                           | a/b               | b/c |                |                |
| <b>208 Lacrimosa</b>  |   |           |             |           |             |                     |                   |           |                           |                   |     |                |                |
| EAM                   | ————  | ————      | 154°        | -62°      | 342°        | -64°                | 0.5865383         | 1.5       | 2.3                       |                   |     |                | Sli+03         |
| L                     | ————  | ————      | 170°        | -68°      | 350°        | -71°                | 0.5865383         | 1.2       | 1.2                       |                   |     |                | Sli+03         |
| Synthesis             | ————  | ————      | 162°        | -65°      | 346°        | -68°                | 0.5865383         | 1.3       |                           |                   |     |                | Synthesis      |
| <b>216 Kleopatra</b>  |   |           |             |           |             |                     |                   |           |                           |                   |     |                |                |
| EA                    | 71° +21°  | 234° +38° | —E—         | —E—       | 0.2243864   |                     |                   |           |                           |                   |     |                | Mag83          |
| A                     | 67° +15°  | 231° +31° | 51° -31°    | 247° -15° | -----       | 2.83                |                   |           |                           |                   |     |                | Zap+84         |
| E                     | 71° +21°  | 234° +38° | —E—         | —E—       | -----       |                     |                   |           |                           |                   |     |                | Kos86          |
| EA                    | 72° +20°  | 235° +34° | —E—         | —E—       | 0.2243865   | 2.78                | 1.5 <sup>2</sup>  |           |                           |                   |     |                | Mag86          |
| E                     |   |           | —E—         | —E—       | 0.22438596  |                     |                   |           |                           |                   |     |                | Lu+87a         |
| EAM                   | 69° +10°  | ————      | —E—         | —E—       | 0.2243870   | 2.54                | 1.32              |           |                           |                   |     |                | Dr+88b         |
| EAM                   | 71° +19°  | 236° +34° | —E—         | —E—       | 0.2243868   | 2.71                | 1.30              |           |                           |                   |     |                | Mag90a         |
| EAM                   | 69° +10°  | ————      | —E—         | —E—       | 0.2243868   | 2.56                | 1.33              |           |                           |                   |     |                | Dru+91         |
| AM                    | 78° +25°  | 229° +45° | 49° -45°    | 258° -25° | -----       | 2.80                | 1.36              |           |                           |                   |     |                | Dot+92         |
| EA                    | 72° +8°   |           | —E—         | —E—       | 0.22438654  | 2.54                | 1.20              |           |                           |                   |     |                | DeA95          |
| Synthesis             | 72° +16°  | 232° +37° | —E—         | —E—       | 0.2243867   | 2.6                 | 1.3               |           |                           |                   |     |                | Synthesis      |
| <b>218 Bianca</b>     |   |           |             |           |             |                     |                   |           |                           |                   |     |                |                |
| EAM                   |   | 340° +60° |             |           | -----       | 1.20                | 1.33              |           |                           |                   |     |                | Kry+96         |
| L                     | ————  | 305° +17° | 121° -10°   | ————      | 0.394499    | shape <sup>31</sup> |                   |           |                           |                   |     |                | Dur+07         |
| Synthesis             | ————  | 305° +17° | 121° -10°   | ————      | 0.394499    | shape <sup>31</sup> |                   |           |                           |                   |     |                | Synthesis      |
| <b>221 Eos</b>        |   |           |             |           |             |                     |                   |           |                           |                   |     |                |                |
| AM                    | 72° +20°  |           |             | 252° -22° | -----       | 1.18                | 1.27              |           |                           |                   |     |                | She+09         |
| <b>225 Henrietta</b>  |   |           |             |           |             |                     |                   |           |                           |                   |     |                |                |
| EAM                   | —E—   | —E—       | ————        | 241° -56° | -----       | 1.27                | 1.89              |           |                           |                   |     |                | Mic93          |
| EAM                   | 135° +13°   |           |             |           | -----       | 1.23                | 1.08              |           |                           |                   |     |                | Mic+00         |
| <b>230 Athamantis</b> |   |           |             |           |             |                     |                   |           |                           |                   |     |                |                |
| AM                    | 91° +44°  | 240° +51° | 60° -51°    | 271° -44° | -----       | 1.318               | 1.195             |           |                           |                   |     |                | Bla+98         |
| L                     | 74° +27°  | 238° +28° | ————        | ————      | 0.999354    | 1.1                 | 1.1 <sup>31</sup> |           |                           |                   |     |                | Tor+03         |
| Synthesis             | 83° +36°  | 239° +40° | ————        | ————      | 0.999354    | 1.1                 | 1.1               |           |                           |                   |     |                | Synthesis      |

| Basic data          | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                    |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code       |
|---------------------|---|-----------|--------------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------------|
|                     | $\lambda_0$   | $\beta_0$ | $\lambda_0$        | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                      |
| <b>236 Honoria</b>  |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| AM                  |   | 358°      | +66°               | 178°      | -66°        |           |             |           | -----                     | 1.224               | 1.142             |                | Bla+96 <sup>34</sup> |
| <b>238 Hypatia</b>  |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| EA                  | 139°  | +27°      | 337°               | +50°      | 157°        | -50°      | 319°        | -27°      | -----                     | 1.38                | 1.00              |                | DeA95                |
| <b>243 Ida</b>      |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| EA                  | —E—   | —E—       | 75°                | -56°      | 264°        | -64°      |             |           | 0.1930680                 | 1.81                | 1.18              |                | Bin+93               |
| EAM                 | —E—   | —E—       | 81°                | -55°      | 263°        | -56°      |             |           | 0.1930680                 | 1.81                | 1.25              | X              | Bin+93               |
| AMF                 |   |           | 67°                | -47°      | 247°        | -47°      |             |           | -----                     | 1.88                | 1.04              | X              | Bin+93               |
| EAM                 | —E—   | —E—       | 71°                | -52°      | 252°        | -54°      |             |           | 0.1930680                 | 1.78                | 1.10              | X              | Bin+93               |
| EAM                 | —E—   | —E—       | 83°                | -62°      | 266°        | -64°      |             |           | 0.1930680                 | 1.86                | 1.31              |                | Bin+93 <sup>27</sup> |
| AM                  |   |           | 81°                | -52°      | 264°        | -54°      |             |           | -----                     | 2.04                | 1.15              |                | Bin+93               |
| C                   | —C—   | —C—       | —C—                |           | 262°        | -68°      |             |           | -----                     |                     |                   |                | Da+94b               |
| C                   | —C—   | —C—       | —C—                |           | 262°        | -67°      |             |           | 0.1930680                 |                     |                   |                | Da+96                |
| L                   | ————  | ————      | 85°                | -47°      | 262°        | -55°      |             |           | 0.19306825                | shape <sup>31</sup> |                   |                | Ka+01                |
| Synthesis           | —C—   | —C—       | —C—                |           | 262°        | -68°      |             |           | 0.1930680                 | 1.8                 | 1.2               |                | Synthesis            |
| <b>250 Bettina</b>  |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| EAM                 | —E—   | —E—       | 104°               | -16°      | ————        |           |             |           | 0.2106225                 | 1.32                | 1.38              |                | Dru+91               |
| AM                  | 96°   | +46°      | 283°               | +21°      | 103°        | -21°      | 276°        | -46°      | -----                     | 1.51                | 1.01              |                | Dot+92 <sup>22</sup> |
| EAM                 | —E—   | —E—       | 85°                | -9°       | 260°        | -35°      |             |           | 0.2106218                 | 1.33                | 1.66              |                | Mic92                |
| EAM                 | —E—   | —E—       | 99°                | -16°      | 272°        | -48°      |             |           | 0.2106014                 | 1.33                | 1.3               |                | Eri+93               |
| EAM                 | —E—   | —E—       | 102°               | -30°      | 272°        | -55°      |             |           | 0.2106224                 | 1.36                | 1.34              |                | Mic93                |
| EA                  | —E—   | —E—       |                    |           | 272°        | -32°      |             |           | 0.2106016                 | 1.45                | 1.05              |                | DeA95                |
| EA                  | —E—   | —E—       | 106°               | -11°      |             |           |             |           | 0.2106219                 | 1.45                | 1.05              |                | DeA95                |
| EA                  |   |           | check <sup>5</sup> |           |             |           |             |           | -----                     |                     |                   |                | Lag+95               |
| AM                  |   | 275°      | +1°                | 95°       | -1°         |           |             |           | -----                     | 1.74                | 1.58              |                | Bla+00               |
| L                   | 100°  | +17°      | ————               | ————      | 282°        | -12°      |             |           | 0.2106006                 | 1.3                 | 1.0 <sup>31</sup> |                | Tor+03               |
| <b>258 Tyche</b>    |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| AM                  | 72°   | +20°      | 222°               | +40°      | 42°         | -40°      | 252°        | -20°      | -----                     | 1.51                | 1.25              |                | Bla+00               |
| <b>263 Dresda</b>   |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| EAM                 | 100°  | +70°      | 276°               | +73°      | ————        | ————      |             |           | 0.7005792                 | 1.5                 | 1.7               |                | Sli+09               |
| L                   | 105°  | +76°      | 285°               | +80°      | ————        | ————      |             |           | 0.7005779                 | 1.3                 | 1.1               |                | Sli+09               |
| Synthesis           | 103°  | +73°      | 282°               | +76°      | ————        | ————      |             |           | 0.7005789                 | 1.4                 | 1.4               |                | Synthesis            |
| <b>270 Anahitia</b> |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| EA                  | ————  |           | 300°               | +65°      | ————        | ————      |             |           | 0.6268967                 | 1.26                | 1.24              |                | Eri00                |
| EAM                 | ————  |           | 285°               | +53°      | ————        | ————      |             |           | 0.6269955                 | 1.24                | 1.31              |                | Tun+02               |
| Synthesis           | ————  |           | 293°               | +59°      | ————        | ————      |             |           | 0.6269                    | 1.25                | 1.28              |                | Synthesis            |
| <b>276 Adelheid</b> |   |           |                    |           |             |           |             |           |                           |                     |                   |                |                      |
| L                   | ————  | ————      | 9°                 | -4°       | 198°        | -20°      |             |           | 0.2633001                 | shape <sup>31</sup> |                   |                | Mar+07               |
| Synthesis           | ————  | ————      | 9°                 | -4°       | 198°        | -20°      |             |           | 0.2633001                 | shape <sup>31</sup> |                   |                | Synthesis            |

| Basic data            | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |                     | Sidereal period<br>(days) | Ellipsoidal model |       | Albedo varieg.       | Reference code |
|-----------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|---------------------|---------------------------|-------------------|-------|----------------------|----------------|
|                       | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$           |                           | a/b               | b/c   |                      |                |
| <b>277 Elvira</b>     |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| EAM                   | ————  | ————      | 56°         | -78°      | 251°        | -77°      | 1.2371719   | 1.5                 | 1.9                       |                   |       | Sli+03               |                |
| L                     | ————  | ————      | 50°         | -79°      | 240°        | -79°      | 1.2371733   | 1.3                 | 1.2                       |                   |       | Sli+03               |                |
| EAM                   | ————  | ————      | 73°         | -74°      | 256°        | -72°      | 1.2371730   | 1.5                 | 1.5                       |                   |       | Sli+09               |                |
| L                     | ————  | ————      | 50°         | -80°      | 244°        | -81°      | 1.2371742   | 1.3                 | 1.2                       |                   |       | Sli+09               |                |
| Synthesis             | ————  | ————      | 64°         | -77°      | 251°        | -76°      | 1.2371741   | 1.4                 | 1.3                       |                   |       | Synthesis            |                |
| <b>278 Paulina</b>    |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| L                     | 123°  | +45°      | 311°        | +28°      | ————        | ————      | 0.270578    | shape <sup>31</sup> |                           |                   |       | Dur+09               |                |
| Synthesis             | 123°  | +45°      | 311°        | +28°      | ————        | ————      | 0.270578    | shape <sup>31</sup> |                           |                   |       | Synthesis            |                |
| <b>281 Lucretia</b>   |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| A                     |   | +90°      | +90°        | -90°      | -90°        | -----     |             |                     |                           |                   |       | Tay+76               |                |
| <b>283 Emma</b>       |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| L                     | 80°   | +37°      | 261°        | +28°      | ————        | ————      | 0.2873008   | 1.4                 | 1.0                       |                   |       | Mic+06               |                |
| Synthesis             | 80°   | +37°      | 261°        | +28°      | ————        | ————      | 0.2873008   | 1.4                 | 1.0                       |                   |       | Synthesis            |                |
| <b>287 Nephthys</b>   |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| AM                    | 99°   | +54°      |             |           | 279°        | -54°      | -----       | 1.306               | 1.207                     |                   |       | Bla+96 <sup>34</sup> |                |
| <b>291 Alice</b>      |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| EAM                   | 66°   | +54°      | 247°        | +55°      | ————        | ————      | -----       | 1.30                | 1.20                      |                   |       | Kry+96               |                |
| L                     | 70°   | +56°      | 253°        | +54°      | ————        | ————      | 0.1798338   | shape <sup>31</sup> |                           |                   |       | Kry+08               |                |
| Synthesis             | 70°   | +56°      | 253°        | +54°      | ————        | ————      | 0.1798338   | shape <sup>31</sup> |                           |                   |       | Synthesis            |                |
| <b>306 Unitas</b>     |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| L                     | ————  | ————      | 79°         | -35°      | 254°        | -18°      | 0.3641145   | shape <sup>31</sup> |                           |                   |       | Dur+07               |                |
| Synthesis             | ————  | ————      | 79°         | -35°      | 254°        | -18°      | 0.3641145   | shape <sup>31</sup> |                           |                   |       | Synthesis            |                |
| <b>311 Claudia</b>    |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| EAM                   | 24°   | +31°      | 207°        | +38°      | ————        | ————      | 0.3138073   | 1.9                 | 0.9                       |                   |       | Sli+03               |                |
| L                     | 24°   | +48°      | 209°        | +48°      | ————        | ————      | 0.3138078   | 1.7                 | 1.2                       |                   |       | Sli+03               |                |
| Synthesis             | 24°   | +40°      | 209°        | +43°      | ————        | ————      | 0.3138075   | 1.8                 | 1.0                       |                   |       | Synthesis            |                |
| <b>312 Pierretta</b>  |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| L                     | ————  | ————      |             | -52°      | -52°        |           | 0.425320    |                     |                           |                   |       | Dur+09               |                |
| <b>321 Florentina</b> |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| EAM                   | ————  | ————      | 96°         | -63°      | 266°        | -67°      | 0.11961940  | 1.5                 | 1.6                       |                   |       | Sli+03               |                |
| L                     | ————  | ————      | 91°         | -60°      | 264°        | -63°      | 0.11961941  | 1.4                 | 1.4                       |                   |       | Sli+03               |                |
| Synthesis             | ————  | ————      | 94°         | -62°      | 265°        | -65°      | 0.11961941  | 1.5                 | 1.5                       |                   |       | Synthesis            |                |
| <b>324 Bamberga</b>   |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| S                     | ————  | ————      | 177°        | -62°      | ————        |           | -----       | 1.1                 | 1.0                       |                   |       | Dru+08               |                |
| <b>334 Chicago</b>    |   |           |             |           |             |           |             |                     |                           |                   |       |                      |                |
| EAM                   | 13°   | +32°      | 188°        | +42°      | —E—         | —E—       | 0.383246    | 1.68                | 1.06                      |                   |       | Mic93                |                |
| AM                    | 18°   | +46°      | 180°        | +59°      | 0°          | -59°      | 198°        | -46°                | -----                     | 2.089             | 1.742 | Bla+98               |                |
| Synthesis             | 15°   | +35°      | 184°        | +50°      | —E—         | —E—       | 0.383246    | 1.88                |                           |                   |       | Synthesis            |                |

| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code |
|----------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                |
| <b>335 Roberta</b>   |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| AM                   | 80°   | +15°      | 258°        | +25°      | 78°         | -25°      | 260°        | -15°      | -----                     | 2.09                | 1.14              |                | Bla+00         |
| <b>337 Devosa</b>    |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EAM                  | —E—   |           | —E—         |           |             |           | 199°        | -51°      | 0.1938078                 | 1.24                | 1.34              |                | Mic92          |
| EAM                  | —   |           | 199°        | +59°      | —E—         |           | —E—         |           | 0.1931106                 | 1.20                | 1.79              |                | Mic93          |
| EA                   | —E—   |           | —E—         |           |             |           | 193°        | -73°      | 0.1938078                 | 1.30                | 1.30              |                | DeA95          |
| L                    | —   |           | 209°        | +43°      | —           |           | —           |           | 0.1939031                 | 1.2                 | 1.5 <sup>31</sup> |                | Tor+03         |
| Synthesis            | —   |           | 204°        | +51°      | —           |           | 195°        | -62°      | 0.1938078                 | 1.25                | 1.56              |                | Synthesis      |
| <b>338 Budrosa</b>   |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| A                    | 152°  | +24°      | 321°        | +33°      | 141°        | -33°      | 332°        | -24°      | -----                     | 1.5                 |                   |                | GiH+95         |
| EAM                  | 172°  | +16°      | —           |           | —           |           | —           |           | 0.1916437                 | 1.54                | 1.20              |                | Tun+02         |
| Synthesis            | 162°  | +20°      | —           |           | —           |           | —           |           | 0.1916437                 | 1.54                | 1.20              |                | Synthesis      |
| <b>349 Dembowska</b> |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| E                    | 150°  | +25°      | 330°        | +5°       | —E—         |           | —E—         |           | 0.1958834                 | <1.3                |                   |                | Mag86          |
| AM                   | 163°  | +49°      | 330°        | +29°      | 150°        | -29°      | 343°        | -49°      | -----                     | 1.28                | 1.15              |                | Za+86b         |
| E                    |   |           |             |           | —E—         |           | —E—         |           | 0.195895                  |                     |                   |                | Lu+87a         |
| EAM                  | 153°  | +35°      | —           |           | —E—         |           | —E—         |           | 0.19588337                | 1.30                | 1.12              |                | Dr+88b         |
| EAM                  | 157°  | +30°      | 331°        | +15°      | —E—         |           | —E—         |           | 0.1958835                 | 1.29                | 1.11              |                | Mag90a         |
| AMF                  | 148°  | +35°      | 180°        | +28°      | 0°          | -28°      | 328°        | -35°      | -----                     |                     |                   |                | Lum+90         |
| EAM                  | 153°  | +36°      | —           |           | —E—         |           | —E—         |           | 0.19588333                | 1.30                | 1.13              |                | Dru+91         |
| EA                   | 152°  | +40°      | —           |           | —E—         |           | —E—         |           | 0.1958841                 | 1.35                | 1.10              |                | DeA95          |
| L                    | 150°  | +23°      | 329°        | 0°        | —           |           | —           |           | 0.195884                  | 1.3                 | 1.4 <sup>31</sup> |                | Tor+03         |
| Synthesis            | 153°  | +34°      | 330°        | +12°      | —           |           | —           |           | 0.1958836                 | 1.31                | 1.12              |                | Synthesis      |
| <b>350 Ornamenta</b> |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| L                    | —   |           | —           |           | —           |           | 184°        | -29°      | 0.3825172                 | shape <sup>31</sup> |                   |                | Mar+09a        |
| Synthesis            | —   |           | —           |           | —           |           | 184°        | -29°      | 0.3825172                 | shape <sup>31</sup> |                   |                | Synthesis      |
| <b>352 Gisela</b>    |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| AM                   |   |           | 213°        | +53°      | 33°         | -53°      |             |           | -----                     | 1.47                | 1.38              |                | Bla+00         |
| <b>354 Eleonora</b>  |   |           |             |           |             |           |             |           |                           |                     |                   |                |                |
| EA                   |   |           | 360°        | +35°      | —E—         |           |             |           | -----                     |                     |                   |                | Lup+81         |
| A                    | 132°  | +45°      | 357°        | +38°      | 177°        | -38°      | 312°        | -45°      | -----                     | 1.36                | 1.0 <sup>1</sup>  |                | Zap+84         |
| A                    | 137°  | +44°      | 363°        | +28°      | 183°        | -28°      | 317°        | -44°      | -----                     | 1.35                | 1.0 <sup>1</sup>  |                | Bur+85         |
| A                    |   |           | 355°        | +36°      | 175°        | -36°      |             |           | -----                     |                     |                   |                | Pii+85         |
| EA                   | 159°  | +22°      | 339°        | +2°       | —E—         |           | —E—         |           | 0.1782160                 | 1.23                | 1.0               |                | Mag86          |
| EAM                  | 170°  | +39°      | 366°        | +2°       | —E—         |           | —E—         |           | 0.17821593                | 1.17                | 1.24              |                | Dr+88b         |
| EAM                  | 148°  | +35°      | 350°        | +21°      | —E—         |           | —E—         |           | 0.1782161                 | 1.21                | 1.11              |                | Mag90a         |
| EAM                  | —   |           | 364°        | +9°       | —E—         |           | —E—         |           | 0.17821596                | 1.17                | 1.20              |                | Dru+91         |
| EA                   |   |           | 365°        | +22°      | —E—         |           | —E—         |           | 0.1782158                 | 1.26                | 1.00              |                | DeA95          |
| L <sup>32</sup>      | —   |           | 356°        | +20°      | —           |           | —           |           | 0.17821583                | 1.2                 | 1.1 <sup>31</sup> |                | Ka+02a         |
| Synthesis            | —   |           | 360°        | +18°      | —           |           | —           |           | 0.1782159                 | 1.21                | 1.1               |                | Synthesis      |

| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                                     |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code       |       |
|----------------------|---|-----------|-------------------------------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------------|-------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$                         | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                      |       |
| <b>355 Gabriella</b> |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| L                    | +69°  |           | +69°                                | ————      | ————        |           |             |           | 0.201208                  |                     |                   |                | Dur+09               |       |
| <b>356 Liguria</b>   |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| R                    |   |           | Concentric ring region <sup>6</sup> |           |             |           |             |           | -----                     |                     |                   |                |                      | Ost87 |
| <b>360 Carlova</b>   |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| EA                   | 108° +51°   |           | 337° +47°                           |           | 157° -47°   |           | 288° -51°   |           | -----                     | 1.57                | 1.00              |                | Dot+95               |       |
| EAM <sup>32</sup>    | 105° +47°   |           | ————                                |           | —E—         |           | —E—         |           | 0.2578997                 | 1.42                | 1.52              |                | Mic+00               |       |
| L                    | 129° +65°   |           | 350° +55°                           |           | ————        |           | ————        |           | 0.2578998                 | shape <sup>31</sup> |                   |                | Dur+09               |       |
| Synthesis            | 115° +55°   |           | 345° +52°                           |           | ————        |           | ————        |           | 0.2578998                 | 1.45                | 1.25              |                | Synthesis            |       |
| <b>367 Amicitia</b>  |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| L                    | 30° +52°  |           | 217° +59°                           |           | ————        |           | ————        |           | 0.2106255                 | shape <sup>31</sup> |                   |                | Kry+08               |       |
| Synthesis            | 30° +52°  |           | 217° +55°                           |           | ————        |           | ————        |           | 0.2106255                 | shape <sup>31</sup> |                   |                | Synthesis            |       |
| <b>372 Palma</b>     |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| AM                   | 44° +78°  |           | 241° +7°                            |           | 61° -7°     |           | 224° -78°   |           | -----                     | 1.202               | 1.066             |                | Bla+98               |       |
| L                    | ————  |           | ————                                |           | 68° +2°     |           | ————        |           | 0.35796                   | 1.1                 | 1.3 <sup>31</sup> |                | Tor+03               |       |
| Synthesis            | ————  |           | ————                                |           | 65° -3°     |           | ————        |           | 0.35796                   | 1.1                 | 1.2               |                | Synthesis            |       |
| <b>376 Geometria</b> |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| EAM                  | 50° +36°  |           | 230° +38°                           |           |             |           |             |           | -----                     | 1.35                | 1.70              |                | Kry+96               |       |
| L                    | ————  |           | ————                                |           | 57° -22°    |           | 240° -35°   |           | 0.3219775                 | 1.0                 | 1.0 <sup>31</sup> |                | Mic+05               |       |
| L                    | 68° +2°   |           | ————                                |           | ————        |           | ————        |           | 0.321251                  | shape <sup>31</sup> |                   |                | Tor+08               |       |
| <b>377 Campania</b>  |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| AM                   | 86° +3°   |           | 266° 0°                             |           | 86° 0°      |           | 266° -3°    |           | -----                     | 1.318               | 0.898             |                | Bla+96 <sup>34</sup> |       |
| L                    | 47° +67°  |           | 196° +66°                           |           | ————        |           | ————        |           | 0.4860167                 | shape <sup>31</sup> |                   |                | Mar+08               |       |
| Synthesis            | 47° +67°  |           | 196° +66°                           |           | ————        |           | ————        |           | 0.4860167                 | shape <sup>31</sup> |                   |                | Synthesis            |       |
| <b>378 Holmia</b>    |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| L                    | 130° +60°   |           | 286° +76°                           |           | ————        |           | ————        |           | 0.1850177                 | shape <sup>31</sup> |                   |                | Mar+08               |       |
| Synthesis            | 130° +60°   |           | 286° +76°                           |           | ————        |           | ————        |           | 0.1850177                 | shape <sup>31</sup> |                   |                | Synthesis            |       |
| <b>382 Dodona</b>    |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| EAM <sup>32</sup>    | 88° +68°  |           | ————                                |           | ————        |           | ————        |           | 0.17138450                | 1.54                | 1.33              |                | Mic+04               |       |
| L                    | 83° +64°  |           | 248° +55°                           |           | ————        |           | ————        |           | 0.17138442                | 1.4                 | 1.3 <sup>31</sup> |                | Mic+04               |       |
| Synthesis            | 86° +66°  |           | ————                                |           | ————        |           | ————        |           | 0.171384                  | 1.5                 | 1.3               |                | Synthesis            |       |
| <b>386 Siegena</b>   |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| AM                   | 56° +14°  |           |                                     |           |             |           | 236° -14°   |           | -----                     | 1.116               | 0.776             |                | Bla+98               |       |
| <b>389 Industria</b> |   |           |                                     |           |             |           |             |           |                           |                     |                   |                |                      |       |
| EAM                  | —E—   |           | —E—                                 |           | 98° -55°    |           | 314° -50°   |           | -----                     | 1.26                | 1.38              |                | Mic93                |       |
| AM                   |   |           | 307° +52°                           |           | 127° -52°   |           |             |           | -----                     | 1.393               | 1.245             |                | Bla+98               |       |

| Basic data          | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |                       |                       |           |                       |           |                       |           | Sidereal period<br>(days) | Ellipsoidal model   |          | Albedo varieg. | Reference code |
|---------------------|---|-----------------------|-----------------------|-----------|-----------------------|-----------|-----------------------|-----------|---------------------------|---------------------|----------|----------------|----------------|
|                     | $\lambda_0$   | $\beta_0$             | $\lambda_0$           | $\beta_0$ | $\lambda_0$           | $\beta_0$ | $\lambda_0$           | $\beta_0$ |                           | a/b                 | b/c      |                |                |
| <b>390 Alma</b>     |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| L                   | ————  | ————                  |                       |           | $-64^\circ$           |           | $-64^\circ$           |           | 0.155882                  |                     |          |                | Dur+09         |
| <b>394 Arduina</b>  |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| L                   | ————  | ————                  |                       |           | $-71^\circ$           |           | $-71^\circ$           |           | 0.69258                   |                     |          |                | Dur+09         |
| <b>409 Aspasia</b>  |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| AM                  | $73^\circ +48^\circ$  | $216^\circ +35^\circ$ | $36^\circ -35^\circ$  |           | $253^\circ -48^\circ$ |           |                       |           | -----                     | 1.137               | 1.080    |                | Bla+98         |
| S                   | $73^\circ +43^\circ$  | ————                  | ————                  |           | ————                  |           |                       |           | -----                     | 1.3                 | 1.0      |                | Dru+09         |
| <b>411 Xanthe</b>   |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| AM                  | $58^\circ +40^\circ$  |                       |                       |           |                       |           | $240^\circ -55^\circ$ |           | -----                     | 1.13                | 1.77     |                | She+09         |
| <b>416 Vaticana</b> |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| EAM <sup>32</sup>   | $132^\circ +58^\circ$   | $310^\circ +22^\circ$ | —E—                   |           | —E—                   |           |                       |           | 0.2238486                 | $1.50^2$            | $1.19^2$ |                | Mic+00         |
| L                   | ————  | $291^\circ +12^\circ$ | ————                  |           | ————                  |           |                       |           | 0.2238165                 | shape <sup>31</sup> |          |                | Dur+09         |
| Synthesis           | ————  | $300^\circ +17^\circ$ | ————                  |           | ————                  |           |                       |           | 0.2238165                 | 1.5                 | 1.2      |                | Synthesis      |
| <b>419 Aurelia</b>  |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| AM                  |   | $192^\circ +34^\circ$ | $13^\circ -34^\circ$  |           |                       |           |                       |           | -----                     | 1.28                | 1.16     |                | Bla+00         |
| <b>423 Diotima</b>  |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| AM                  | $170^\circ +63^\circ$   | $345^\circ +31^\circ$ | $165^\circ -31^\circ$ |           | $350^\circ -63^\circ$ |           |                       |           | -----                     | 1.14                | 1.50     |                | Za+86b         |
| EA                  | $140^\circ +55^\circ$   | ————                  | —E—                   |           | —E—                   |           |                       |           | 0.1989448                 | 1.16                | 1.05     |                | Dot+95         |
| L                   | ————  | $351^\circ +4^\circ$  | ————                  |           | ————                  |           |                       |           | 0.1989740                 | shape <sup>31</sup> |          |                | Dur+07         |
| Synthesis           | ————  | $351^\circ +4^\circ$  | ————                  |           | ————                  |           |                       |           | 0.1989740                 | shape <sup>31</sup> |          |                | Synthesis      |
| <b>432 Pythia</b>   |   |                       |                       |           |                       |           |                       |           |                           |                     |          |                |                |
| AM                  | $121^\circ +65^\circ$   |                       |                       |           |                       |           | $301^\circ -65^\circ$ |           | -----                     | 1.37                | 1.27     |                | Bla+00         |

| Basic data              | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |                     |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code |
|-------------------------|---|-----------|-------------|-----------|---------------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------|
|                         | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$         | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                |
| <b>433 Eros</b>         |   |           |             |           |                     |           |             |           |                           |                     |                   |                |                |
| V                       | 29°   | +22°      |             |           | —V—                 |           |             |           | -----                     |                     |                   |                | Zes32          |
| A                       | 4°  | +45°      |             |           | 184°                | -45°      |             |           | -----                     |                     |                   |                | Ros32          |
| AM                      | 2°  | +53°      |             |           | 182°                | -53°      |             |           | -----                     | 1.79                | 1.18              |                | Kru+36         |
| V A                     |   |           |             |           | —V—                 | 169°      | -62°        |           | -----                     |                     |                   |                | Wat37          |
| VEA                     |   |           |             |           | moving <sup>3</sup> | —E—       |             |           | 0.2195937                 |                     |                   |                | Sto40          |
| EA                      | -7°   | +13°      |             |           | —E—                 |           |             |           | 0.21959390                |                     |                   |                | Bey53          |
| EA                      | 10°   | +46°      |             |           | —E—                 |           |             |           | 0.21959386                | 4.0                 | 1.0 <sup>1</sup>  |                | Cai56          |
| E                       | 13°   | +28°      |             |           | —E—                 |           |             |           | -----                     |                     |                   |                | Ves71          |
| A                       | 17°   | +10°      |             |           |                     |           |             |           | 0.21959                   |                     |                   |                | Sc+76b         |
| A                       | 15°   | +9°       |             |           |                     |           |             |           | -----                     | 2.3                 |                   |                | Mi+76          |
| E                       | 16°   | +12°      |             |           | —E—                 |           |             |           | 0.219599                  | shape <sup>8</sup>  |                   |                | Dun76          |
| A                       | moving <sup>3</sup>   |           |             |           |                     |           |             |           | -----                     | 4.0                 | 1.25              |                | Che+77         |
| AM                      | 15°   | +20°      |             |           |                     |           |             |           | -----                     | 2.33                | 1.00              |                | Lum+81         |
| S                       | 23°   | +37°      |             |           | —S—                 |           |             |           | -----                     | 2.79                | 1.03              |                | Dr+85a         |
| E                       | 22°   | +9°       |             |           | —E—                 |           |             |           | 0.219588                  |                     |                   |                | Tay85          |
| E                       | 16°   | +6°       |             |           | —E—                 |           |             |           | -----                     |                     |                   |                | Kos86          |
| A                       |   |           |             |           | check <sup>5</sup>  |           |             |           | -----                     |                     |                   |                | Mi+90b         |
| E                       |   |           |             |           |                     |           |             |           | 0.219593957               |                     |                   |                | Mag90b         |
| C                       | 19°   | +14°      | ————        | ————      | ————                | ————      | ————        |           | -----                     | shape <sup>10</sup> |                   |                | Th+00          |
| L                       | 16°   | +9°       | ————        | ————      | ————                | ————      | ————        |           | 0.21959387                | shape <sup>31</sup> |                   |                | Ka+01          |
| C <sup>32, 33</sup>     | 17°   | +11°      | ————        | ————      | ————                | ————      | ————        |           | 0.21959273                | shape <sup>10</sup> |                   |                | Mill+02        |
| Synthesis               | 17°   | +11°      | ————        | ————      | ————                | ————      | ————        |           | 0.219593                  | shape <sup>10</sup> |                   |                | Synthesis      |
| <b>451 Patientia</b>    |   |           |             |           |                     |           |             |           |                           |                     |                   |                |                |
| AM                      | 153°  | +67°      | 345°        | +25°      | 165°                | -25°      | 333°        | -67°      | -----                     | 1.07                | 1.0               |                | Za+86b         |
| L                       | 39°   | +21°      | 163°        | +25°      | ————                | ————      | ————        | ————      | 0.4058829                 | 1.0                 | 1.0 <sup>31</sup> |                | Mic+05         |
| Synthesis               | 39°   | +21°      | 163°        | +25°      | ————                | ————      | ————        | ————      | 0.4058829                 | 1.0                 | 1.0               |                | Synthesis      |
| <b>462 Eriphyla</b>     |   |           |             |           |                     |           |             |           |                           |                     |                   |                |                |
| EAM                     | ————  | ————      | 101°        | +48°      | ————                | ————      | 289°        | +48°      | 0.3607880                 | 1.2                 | 1.1               |                | Sli+09         |
| L                       | ————  | ————      | 108°        | +35°      | ————                | ————      | 294°        | +34°      | 0.3607875                 | 1.2                 | 1.3               |                | Sli+09         |
| Synthesis               | ————  | ————      | 106°        | +39°      | ————                | ————      | 293°        | +39°      | 0.3607875                 | 1.2                 | 1.2               |                | Synthesis      |
| <b>471 Papagena</b>     |   |           |             |           |                     |           |             |           |                           |                     |                   |                |                |
| AM                      | 21°   | +31°      |             |           |                     |           | 201°        | -31°      | -----                     | 1.25                | 1.38              |                | Bla+00         |
| L                       | 29°   | +41°      | ————        | ————      | ————                | ————      | ————        | ————      | 0.296402                  |                     |                   |                | Tor+08         |
| L                       | ————  | ————      | 222°        | +40°      | ————                | ————      | ————        | ————      | 0.296353                  |                     |                   |                | Tor+08         |
| L                       | ————  | ————      | 235°        | +56°      | ————                | ————      | ————        | ————      | 0.296463                  |                     |                   |                | Tor+08         |
| <b>484 Pittsburghia</b> |   |           |             |           |                     |           |             |           |                           |                     |                   |                |                |
| L                       | 69°   | +47°      | ————        | ————      | ————                | ————      | ————        | ————      | 0.443740                  | shape <sup>31</sup> |                   |                | Dur+09         |
| Synthesis               | 69°   | +47°      | ————        | ————      | ————                | ————      | ————        | ————      | 0.443740                  | shape <sup>31</sup> |                   |                | Synthesis      |



| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |                    |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code |
|----------------------|---|-----------|-------------|-----------|--------------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$        | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                |
| <b>487 Venetia</b>   |   |           |             |           |                    |           |             |           |                           |                     |                   |                |                |
| EAM                  | ————  | ————      | ————        | ————      | ————               | ————      | 268°        | -24°      | 0.555897                  | 1.07                | 2.01              |                | Eri00          |
| EAM                  | ————  | ————      | ————        | ————      | ————               | ————      | 259°        | -30°      | 0.5554876                 | 1.28                | 1.69              |                | Tun+02         |
| Synthesis            | ————  | ————      | ————        | ————      | ————               | ————      | 264°        | -27°      | 0.5556                    | 1.17                | 1.8               |                | Synthesis      |
| <b>495 Eulalia</b>   |   |           |             |           |                    |           |             |           |                           |                     |                   |                |                |
| Z                    |   |           | 224°        | +2°       | 44°                | -2°       |             |           | -----                     |                     |                   |                | Bin87          |
| <b>505 Cava</b>      |   |           |             |           |                    |           |             |           |                           |                     |                   |                |                |
| Z                    | 113°  | +4°       |             |           |                    |           | 293°        | -10°      | -----                     |                     |                   |                | You+85         |
| EAM                  | 138°  | +40°      | 325°        | +27°      |                    |           |             |           | -----                     | 1.22                | 1.20              |                | Mic96a         |
| <b>511 Davida</b>    |   |           |             |           |                    |           |             |           |                           |                     |                   |                |                |
| AM                   | 122°  | +10°      |             |           |                    |           | 302°        | -10°      | -----                     |                     |                   |                | Geh+62         |
| A                    | ————  |           | 306°        | +34°      | 126°               | -34°      | ————        |           | -----                     |                     |                   |                | Cha+63         |
| E                    | ————  |           | 285°        | +45°      | —E—                |           |             |           | -----                     |                     |                   |                | Ves+85         |
| AM                   | 92°   | +33°      | 303°        | +34°      | 123°               | -34°      | 272°        | -33°      | -----                     | 1.19                | 1.13              |                | Za+86a         |
| S                    | —S—   |           | 291°        | +37°      | —S—                |           | —S—         |           | -----                     | 1.30                | 1.4               |                | Dru+86         |
| AM                   |   |           | 307°        | +32°      | 127°               | -32°      |             |           | -----                     | 1.25                | 1.14              |                | Dru+86         |
| EAM                  | ————  |           | 300°        | +32°      | —E—                |           | —E—         |           | 0.21372345                | 1.25                | 1.16              |                | Dr+88b         |
| EAM                  | 99°   | +26°      | 299°        | +26°      | —E—                |           | —E—         |           | 0.21372348                | 1.22                | 1.13              |                | Mag90a         |
| EAM                  | ————  |           | 300°        | +32°      | —E—                |           | —E—         |           | 0.21372345                | 1.25                | 1.16              |                | Dru+91         |
| EAM                  | 96°   | +32°      | 303°        | +31°      | —E—                |           | —E—         |           | 0.2137234                 | 1.23                | 1.12              |                | Mic93          |
| EA                   |   |           | 298°        | +22°      | —E—                |           | —E—         |           | 0.21372354                | 1.24                | 1.06              |                | DeA95          |
| EA                   |   |           |             |           | check <sup>5</sup> |           |             |           | -----                     |                     |                   |                | Lag+95         |
| L                    | ————  |           | 303°        | +44°      | ————               |           | ————        |           | 0.2137236                 | 1.2                 | 1.3 <sup>31</sup> |                | Tor+03         |
| S                    | ————  |           | 297°        | +21°      | ————               |           | ————        |           | -----                     | 1.24                | 1.18              |                | Con+07         |
| Synthesis            | ————  |           | 300°        | +30°      | ————               |           | ————        |           | 0.2137235                 | 1.24                | 1.13              |                | Synthesis      |
| <b>516 Amherstia</b> |   |           |             |           |                    |           |             |           |                           |                     |                   |                |                |
| EA                   | 75°   | +63°      | 256°        | +55°      | 76°                | -55°      | 255°        | -63°      | -----                     | 1.82                | 1.85              |                | DeA95          |
| EAM                  | 76°   | +30°      |             |           |                    |           |             |           | -----                     | 1.53                | 1.23              |                | Mic96a         |
| EAM <sup>32</sup>    | 75°   | +17°      |             |           |                    |           | 225°        | -17°      | 0.3116333 <sup>2</sup>    | 1.36                | 1.82              |                | Mic+00         |
| L                    | 80°   | +53°      | 253°        | +22°      | ————               |           | ————        |           | 0.311846                  | shape <sup>31</sup> |                   |                | Dur+09         |
| Synthesis            | 78°   | +45°      | 254°        | +30°      | ————               |           | ————        |           | 0.311846                  | shape <sup>31</sup> |                   |                | Synthesis      |

| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |                                     |           |             |           |             |            | Sidereal period<br>(days) | Ellipsoidal model |                 | Albedo varieg. | Reference code |       |
|----------------------|---|-----------|-------------------------------------|-----------|-------------|-----------|-------------|------------|---------------------------|-------------------|-----------------|----------------|----------------|-------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$                         | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$  |                           | a/b               | b/c             |                |                |       |
| <b>532 Herculina</b> |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| S                    |   |           |                                     |           |             | 132°      | -59°        | -----      | 1.21                      | 1.01              |                 |                | Dr+85b         |       |
| E                    |   |           |                                     |           | 96°         | -1°       |             | 0.3918711  | 1.0 <sup>1</sup>          | 1.0 <sup>1</sup>  | X <sup>19</sup> |                | Tay+87         |       |
| EAM                  |   |           | 284°                                | +34°      |             |           |             | 0.3918764  | 1.13                      | 1.05              |                 |                | Kwi+92         |       |
| EA                   |   |           |                                     |           | 87°         | -7°       |             | 0.3918710  | 1.24                      | 1.06              |                 |                | DeA95          |       |
| EAM                  | -----   |           | 291°                                | +18°      | —E—         |           | —E—         | 0.3918720  | 1.21                      | 1.13              |                 |                | Mic+95         |       |
| A <sup>28</sup>      |   |           | 295°                                | +18°      |             |           |             | -----      | 1.21                      | 1.20              |                 |                | Mic96b         |       |
| E                    | 91°   | +21°      | 271°                                | +21°      | —E—         |           | —E—         | 0.3918712  |                           |                   |                 |                | Sza+99         |       |
| L                    | -----   |           | 289°                                | +10°      | -----       |           | -----       | 0.39187296 | 1.1                       | 1.2 <sup>31</sup> |                 |                | Ka+02a         |       |
| Synthesis            | -----   |           | 287°                                | +17°      | -----       |           | -----       | 0.391872   | 1.2                       | 1.2               |                 |                | Synthesis      |       |
| <b>534 Nassovia</b>  |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| EAM                  | 52°   | +42°      | 238°                                | +47°      | -----       |           | -----       | 0.3945380  | 1.4                       | 1.5               |                 |                | Sli+03         |       |
| L                    | 58°   | +50°      | 244°                                | +51°      | -----       |           | -----       | 0.3945400  | 1.3                       | 1.4               |                 |                | Sli+03         |       |
| EAM                  | 67°   | +40°      | 253°                                | +44°      | -----       |           | -----       | 0.3945377  | 1.3                       | 1.3               |                 |                | Sli+09         |       |
| L                    | 57°   | +54°      | 244°                                | +54°      | -----       |           | -----       | 0.3945383  | 1.3                       | 1.4               |                 |                | Sli+09         |       |
| Synthesis            | 60°   | +47°      | 247°                                | +49°      | -----       |           | -----       | 0.3945378  | 1.3                       | 1.4               |                 |                | Synthesis      |       |
| <b>540 Rosamunde</b> |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| L                    |   | +57°      |                                     | +57°      | -----       |           | -----       | 0.389491   |                           |                   |                 |                | Dur+09         |       |
| <b>537 Pauly</b>     |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| AM                   |   |           | 290°                                | +40°      | 110°        | -40°      |             | -----      | 1.25                      | 1.88              |                 |                | Bla+00         |       |
| <b>544 Jetta</b>     |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| L                    | -----   |           | -----                               |           | -66°        |           | -66°        | 0.322719   |                           |                   |                 |                | Dur+09         |       |
| <b>550 Senta</b>     |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| L                    | -----   |           | -----                               |           | -64°        |           | -64°        | 0.85720    |                           |                   |                 |                | Dur+09         |       |
| <b>554 Perago</b>    |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| R                    |   |           | Concentric ring region <sup>6</sup> |           |             |           |             | -----      |                           |                   |                 |                |                | Ost87 |
| <b>556 Phyllis</b>   |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| L                    | 35°   | +55°      | 209°                                | +41°      | -----       |           | -----       | 0.1788592  | shape <sup>31</sup>       |                   |                 |                | Mar+07         |       |
| Synthesis            | 35°   | +55°      | 209°                                | +41°      | -----       |           | -----       | 0.1788592  | shape <sup>31</sup>       |                   |                 |                | Synthesis      |       |
| <b>579 Sidonia</b>   |   |           |                                     |           |             |           |             |            |                           |                   |                 |                |                |       |
| Z                    | 96°   | +7°       |                                     |           |             |           | 276°        | -7°        | -----                     |                   |                 |                | Bin87          |       |

| Basic data           | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |                     | Sidereal period<br>(days) | Ellipsoidal model |                   | Albedo varieg. | Reference code       |
|----------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|---------------------|---------------------------|-------------------|-------------------|----------------|----------------------|
|                      | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$           |                           | a/b               | b/c               |                |                      |
| <b>584 Semiramis</b> |   |           |             |           |             |           |             |                     |                           |                   |                   |                |                      |
| EAM                  | —E—   | —E—       | —           | —         | 327°        | -55°      | 0.2112053   | 1.19                | 1.28                      |                   |                   |                | Dr+88b               |
| EAM                  | —E—   | —E—       | 110°        | -40°      | 320°        | -30°      | 0.211206    | 1.17                | 1.1                       |                   |                   |                | Mag90a               |
| EAM                  | —E—   | —E—       | 112°        | -51°      | —           | —         | 0.2112062   | 1.36                | 1.34                      |                   |                   |                | Mic93                |
| EA                   | —E—   | —E—       | 122°        | -56°      | 315°        | -43°      | 0.2112060   | 1.27                | 1.14 <sup>2</sup>         |                   |                   |                | DeA95                |
| EAM                  | —E—   | —E—       | —           | —         | 334°        | -51°      | 0.2112061   | 1.25                | 1.12                      |                   |                   |                | Mic96a               |
| L                    | —   | —         | 106°        | -39°      | —           | —         | 0.211205    | 1.3                 | 1.2 <sup>31</sup>         |                   |                   |                | Tor+03               |
| Synthesis            | —   | —         | 113°        | -47°      | 335°        | -50°      | 0.2112061   | 1.25                | 1.12                      |                   |                   |                | Synthesis            |
| <b>614 Pia</b>       |   |           |             |           |             |           |             |                     |                           |                   |                   |                |                      |
| L                    | 165°  | +32°      | 354°        | +45°      | —           | —         | 0.190779    | shape <sup>31</sup> |                           |                   |                   |                | Dur+09               |
| Synthesis            | 165°  | +32°      | 354°        | +45°      | —           | —         | 0.190779    | shape <sup>31</sup> |                           |                   |                   |                | Synthesis            |
| <b>624 Hektor</b>    |   |           |             |           |             |           |             |                     |                           |                   |                   |                |                      |
| E                    | —   | —         | 324°        | +10°      | —E—         | —E—       | 0.28843884  | shape <sup>8</sup>  |                           |                   |                   |                | Dun+69               |
| A                    |   |           | 313°        | +11°      | 133°        | -11°      | -----       | 2.00                | 2.63 <sup>11</sup>        |                   |                   |                | Pou81                |
| A                    |   |           | 315°        | +10°      | 135°        | -10°      | -----       | 2.02                | 1.0 <sup>1</sup>          |                   |                   |                | Pou81                |
| EA                   | 144°  | +10°      | —           | —         | 322°        | -4°       | 0.2884382   |                     |                           |                   |                   |                | Mag83                |
| AM                   | 152°  | +29°      | 314°        | +15°      | 134°        | -15°      | 332°        | -29°                | -----                     | 2.66              | 1.13              |                | Zap+84               |
| A D                  | 152°  | +27°      | 315°        | +16°      | 135°        | -16°      | 332°        | -27°                | -----                     | 2.26              | 1.35 <sup>2</sup> |                | Pos+85               |
| EA                   | —E—   | —E—       | 134°        | -15°      | 330°        | -30°      | 0.2883544   | 2.70                | 1.43                      |                   |                   |                | Mag86                |
| EAMD                 |   |           | 314°        | +17°      | —E—         | —E—       | 0.288335    | 2.22                | 1.19                      |                   |                   |                | Uch+87               |
| E                    | —E—   | —E—       | 134°        | -17°      | 336°        | -32°      | 0.2883546   |                     |                           |                   |                   |                | Mic88                |
| EA                   | —E—   | —E—       | 328°        | -26°      | 0.2883541   |           | 2.57        | 1.30                |                           |                   |                   |                | DeA92                |
| AMD                  | 152°  | +27°      | 315°        | +16°      | 135°        | -16°      | 332°        | -27°                | -----                     | 2.26              | 1.36 <sup>2</sup> |                | Det+92 <sup>25</sup> |
| EAMD                 | 145°  | +3°       | —           | —         | 325°        | -3°       | -----       | 1.0 <sup>1</sup>    | 1.0 <sup>1</sup>          | X <sup>15</sup>   |                   |                | Det+92 <sup>25</sup> |
| EAMD                 | 149°  | +22°      | —           | —         | 329°        | -22°      | -----       | shape <sup>14</sup> |                           |                   |                   |                | Det+92 <sup>25</sup> |
| EAMD                 | 144°  | +11°      | —           | —         | 324°        | -11°      | -----       | shape <sup>14</sup> |                           |                   |                   |                | Det+92 <sup>25</sup> |
| E                    | —E—   | —E—       | 133°        | -17°      | 336°        | -33°      | 0.28835459  |                     |                           |                   |                   |                | Det+92 <sup>25</sup> |
| EA                   | —E—   | —E—       | 328°        | -26°      | 0.2883541   |           | 2.57        | 1.30                |                           |                   |                   |                | DeA95                |
| AM                   | 147°  | +20°      | 316°        | +3°       | 136°        | -3°       | 327°        | -20°                | -----                     | 2.779             | 1.000             |                | Bla+98               |
| E                    | —E—   | —E—       | 128°        | -14°      | 308°        | -14°      | 0.28835474  |                     |                           |                   |                   |                | Sza+99               |
| Synthesis            | —E—   | —E—       | 133°        | -16°      | 329°        | -25°      | 0.2883544   | 2.4                 | 1.3                       |                   |                   |                | Synthesis            |
| <b>628 Christine</b> |   |           |             |           |             |           |             |                     |                           |                   |                   |                |                      |
| L                    | —   | —         | 24°         | -61°      | 209°        | -34°      | 0.673872    | shape <sup>31</sup> |                           |                   |                   |                | Dur+09               |
| Synthesis            | —   | —         | 24°         | -61°      | 209°        | -34°      | 0.673872    | shape <sup>31</sup> |                           |                   |                   |                | Synthesis            |
| <b>636 Erika</b>     |   |           |             |           |             |           |             |                     |                           |                   |                   |                |                      |
| L                    | —   | —         | —           | —         | -52°        | -52°      | 0.608648    |                     |                           |                   |                   |                | Dur+09               |
| <b>665 Sabine</b>    |   |           |             |           |             |           |             |                     |                           |                   |                   |                |                      |
| L                    | —   | —         | —           | —         | 310°        | -77°      | 0.1789179   | 1.3                 | 1.2                       |                   |                   |                | Mic+06               |
| Synthesis            | —   | —         | —           | —         | 310°        | -77°      | 0.1789179   | 1.3                 | 1.2                       |                   |                   |                | Synthesis            |
| <b>674 Rachele</b>   |   |           |             |           |             |           |             |                     |                           |                   |                   |                |                      |
| EAM                  | 12°   | +2°       | —           | —         | —           | —         | 1.2898610   | 1.93                | 1.09                      |                   |                   |                | Tun+02               |

| Basic data             | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |                                     |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                   | Albedo varieg. | Reference code |       |
|------------------------|---|-------------------------------------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|-------------------|----------------|----------------|-------|
|                        | $\lambda_0$   | $\beta_0$                           | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c               |                |                |       |
| <b>675 Ludmilla</b>    |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| EAM                    | —E—   | —E—                                 | 12°         | -45°      |             |           |             |           | 0.3215510                 | 1.44                | 1.89              |                | Vel+95         |       |
| EAM                    | —E—   | —E—                                 | 15°         | -35°      | 205°        | -50°      |             |           | 0.321551                  | 1.37                | 1.3               |                | Vel+95         |       |
| L                      | —   | —                                   | 20°         | -36°      | 215°        | -54°      |             |           | 0.3215506                 | 1.3                 | 1.1 <sup>31</sup> |                | Tor+03         |       |
| Synthesis              | —   | —                                   | 16°         | -39°      | 210°        | -52°      |             |           | 0.321551                  | 1.3                 | 1.2               |                | Synthesis      |       |
| <b>679 Pax</b>         |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| AM                     |   | 245° +5°                            | 65°         | -5°       |             |           |             |           | -----                     | 1.18                | 1.30              |                | She+09         |       |
| <b>683 Lanzia</b>      |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| EA                     | 198° +55°   | 342° +55°                           | 18°         | -55°      | 165°        | -55°      |             |           | -----                     | 1.85                | 1.00              |                | DeA95          |       |
| EA                     | —E—   | —E—                                 | 15°         | -52°      | 195°        | -52°      |             |           | 0.1964156                 | 1.15                | 1.05              |                | Kis+99         |       |
| Synthesis              | —E—   | —E—                                 | 16°         | -53°      | 190°        | -53°      |             |           | 0.1964156                 |                     |                   |                | Synthesis      |       |
| <b>690 Wratislavia</b> |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| L                      | 177° +17°   | 359° +45°                           | —           | —         |             |           |             |           | 0.3590825                 | 1.1                 | 1.3               |                | Mic+06         |       |
| <b>694 Ekard</b>       |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| R                      |   | Concentric ring region <sup>6</sup> |             |           |             |           |             |           | -----                     |                     |                   |                |                | Ost87 |
| EAM                    | 96° +32°  | —                                   | —E—         | —E—       |             |           |             |           | 0.246744                  | 1.42                | 1.38              |                | Dr+88b         |       |
| EAM                    | 105° +29°   | 267° +56°                           | —E—         | —E—       |             |           |             |           | 0.2467465 <sup>2</sup>    | 1.45                | 1.32 <sup>2</sup> |                | Dru+91         |       |
| EAM                    | 98° +40°  | —                                   | —E—         | —E—       |             |           |             |           | 0.2467460                 | 1.46                | 1.73              |                | Mic93          |       |
| EA                     | 86° +25°  | 242° +25°                           | —E—         | —E—       |             |           |             |           | 0.2467459                 | 1.34                | 1.22 <sup>2</sup> |                | DeA95          |       |
| L                      | —   | —                                   | 89°         | -48°      | —           | —         |             |           | 0.2467501                 | 1.2                 | 1.1 <sup>31</sup> |                | Tor+03         |       |
| Synthesis              | 98° +40°  | —                                   | 89°         | -48°      | —           | —         |             |           | 0.2467501                 | 1.3                 |                   |                | Synthesis      |       |
| <b>700 Auravictrix</b> |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| AM                     |   | 265° +56°                           | 86°         | -58°      |             |           |             |           | -----                     | 1.43                | 1.92              |                | She+09         |       |
| <b>704 Interamnia</b>  |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| Z                      | 70° +10°  |                                     |             |           | 250°        | -10°      |             |           | -----                     |                     |                   |                | Har+79         |       |
| EAM                    | —E—   | —E—                                 | 43°         | -21°      | 224°        | -22°      |             |           | -----                     | 1.19 <sup>2</sup>   | 1.07              |                | Mic93          |       |
| EA                     |   |                                     | 47°         | -3°       | 227°        | +1°       |             |           | -----                     | 1.11                | 1.06              |                | DeA95          |       |
| EAM                    | 51° +22°  | —                                   | —E—         | —E—       |             |           |             |           | 0.3636372                 | 1.11                | 1.13              |                | Mic+95         |       |
| S                      | 36° +12°  | —                                   | —           | —         |             |           |             |           | -----                     | 1.14                | 2.1               |                | Dru+08         |       |
| S                      | 47° +66°  | —                                   | —           | —         |             |           |             |           | -----                     | 1.03                | 1.24              |                | Dru+09         |       |
| Synthesis              | 46° +30°  | —                                   | —           | —         |             |           |             |           | 0.3636372                 | 1.1                 |                   |                | Synthesis      |       |
| <b>714 Ulula</b>       |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| L                      | —   | —                                   | 40°         | -4°       | 225°        | -13°      |             |           | 0.291599                  | shape <sup>31</sup> |                   |                | Dur+09         |       |
| Synthesis              | —   | —                                   | 40°         | -4°       | 225°        | -13°      |             |           | 0.291599                  | shape <sup>31</sup> |                   |                | Synthesis      |       |
| <b>720 Bohlinia</b>    |   |                                     |             |           |             |           |             |           |                           |                     |                   |                |                |       |
| EAM <sup>32</sup>      | 65° +40°  | 249° +37°                           | —           | —         |             |           |             |           | 0.3716084                 | 1.4                 | 1.2               |                | Sli+03         |       |
| L <sup>32</sup>        | 40° +43°  | 230° +41°                           | —           | —         |             |           |             |           | 0.3716090                 | 1.4                 | 1.3               |                | Sli+03         |       |
| Synthesis              | 48° +41°  | 236° +38°                           | —           | —         |             |           |             |           | 0.3716088                 | 1.4                 | 1.3               |                | Synthesis      |       |

| Basic data            | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |      | Albedo varieg. | Reference code |
|-----------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|------|----------------|----------------|
|                       | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c  |                |                |
| <b>747 Winchester</b> |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| EAM                   | 27°   | +50°      | ————        | ————      | —E—         | —E—       | ————        | ————      | -----                     | 1.16                | 2.60 |                | Mic93          |
| EA                    |   |           | 353°        | +39°      | 173°        | -39°      | ————        | ————      | -----                     | 1.18                | 1.00 |                | DeA95          |
| L                     | ————  | ————      | ————        | ————      | 166°        | -44°      | 296°        | -61°      | 0.3922836                 | shape <sup>31</sup> |      |                | Mar+09         |
| Synthesis             | ————  | ————      | ————        | ————      | 165°        | -43°      | 296°        | -61°      | 0.3922836                 | 1.17                |      |                | Synthesis      |
| <b>770 Bali</b>       |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| L                     | 68°   | +44°      | 256°        | +40°      | ————        | ————      | ————        | ————      | 0.242456                  | shape <sup>31</sup> |      |                | Dur+09         |
| Synthesis             | 68°   | +44°      | 256°        | +40°      | ————        | ————      | ————        | ————      | 0.242456                  | shape <sup>31</sup> |      |                | Synthesis      |
| <b>771 Libera</b>     |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| L                     | ————  | ————      | ————        | ————      | 64°         | -78°      | ————        | ————      | 0.2455925                 | shape <sup>31</sup> |      |                | Mar+09a        |
| Synthesis             | ————  | ————      | ————        | ————      | 64°         | -78°      | ————        | ————      | 0.2455925                 | shape <sup>31</sup> |      |                | Synthesis      |
| <b>776 Berbericia</b> |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| EAM                   | 7°  | +20°      | ————        | ————      | ————        | ————      | ————        | ————      | 0.3194588                 | 1.09                | 1.30 |                | Eri00          |
| EAM                   | 8°  | +23°      | ————        | ————      | ————        | ————      | ————        | ————      | 0.3194538                 | 1.18                | 1.18 |                | Tun+02         |
| L                     | ————  | ————      | 347°        | +12°      | ————        | ————      | ————        | ————      | 0.3194587                 | shape <sup>31</sup> |      |                | Dur+07         |
| L                     | 170°  | +59°      | 347°        | +11°      | ————        | ————      | ————        | ————      | 0.319449                  | shape <sup>31</sup> |      |                | Tor+08         |
| Synthesis             | ————  | ————      | 347°        | +12°      | ————        | ————      | ————        | ————      | 0.3194587                 | 1.14                | 1.2  |                | Synthesis      |
| <b>787 Moskva</b>     |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| AM                    | 80°   | +36°      | ————        | ————      | ————        | ————      | 260°        | -36°      | -----                     | 2.26                | 1.44 |                | She+09         |
| <b>804 Hispania</b>   |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| EAM                   | 90°   | +28°      | ————        | ————      | ————        | ————      | 270°        | -28°      | -----                     | 1.17                | 1.92 |                | Mic92          |
| EA                    | 107°  | +49°      | 227°        | +50°      | 47°         | -50°      | 287°        | -49°      | -----                     | 1.20                | 2.00 |                | DeA95          |
| <b>825 Tanina</b>     |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| L                     | 38°   | +51°      | 232°        | +53°      | ————        | ————      | ————        | ————      | 0.2891587                 | shape <sup>31</sup> |      |                | Kry+08         |
| L                     |   | +54°      |             | +54°      | ————        | ————      | ————        | ————      | 0.289159                  | shape <sup>31</sup> |      |                | Dur+09         |
| Synthesis             | 38°   | +51°      | 232°        | +53°      | ————        | ————      | ————        | ————      | 0.2891587                 | shape <sup>31</sup> |      |                | Synthesis      |
| <b>849 Ara</b>        |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| L                     | ————  | ————      | ————        | ————      | 17°         | -10°      | 213°        | -33°      | 0.1715163                 | shape <sup>31</sup> |      |                | Dur+09         |
| L                     | ————  | ————      | ————        | ————      | 10°         | -25°      | 223°        | -40°      | 0.1715163                 | shape <sup>31</sup> |      |                | Mar+09         |
| Synthesis             | ————  | ————      | ————        | ————      | 12°         | -23°      | 220°        | -38°      | 0.1715163                 | shape <sup>31</sup> |      |                | Synthesis      |
| <b>852 Wladilena</b>  |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| A                     | 53°   | +24°      | 235°        | +21°      | 55°         | -21°      | 233°        | -24°      | -----                     | 1.23                | 1.15 |                | DeA+95         |
| A                     | 30°   | +30°      | 210°        | +30°      | 30°         | -30°      | 210°        | -30°      | -----                     | 2.3                 | 1.2  |                | Kis+99         |
| <b>887 Alinda</b>     |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| EAM                   |   |           | 190°        | +33°      | ————        | ————      | ————        | ————      | 3.0760710                 | 1.06                | 1.56 |                | Tun+02         |
| <b>915 Cosette</b>    |   |           |             |           |             |           |             |           |                           |                     |      |                |                |
| L                     | 185°  | +50°      | 348°        | +55°      | ————        | ————      | ————        | ————      | 0.1862392                 | shape <sup>31</sup> |      |                | Dur+09         |
| Synthesis             | 185°  | +50°      | 348°        | +55°      | ————        | ————      | ————        | ————      | 0.1862392                 | shape <sup>31</sup> |      |                | Synthesis      |

| Basic data             | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model         |                     | Albedo varieg. | Reference code |
|------------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------------|---------------------|----------------|----------------|
|                        | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                       | b/c                 |                |                |
| <b>944 Hidalgo</b>     |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| L                      | ————  |           | 281°        | +5°       | ————        |           | ————        |           | 0.4191097                 |                           | shape <sup>31</sup> |                | Dur+07         |
| Synthesis L            | ————  |           | 281°        | +5°       | ————        |           | ————        |           | 0.4191097                 |                           | shape <sup>31</sup> |                | Synthesis      |
| <b>951 Gaspra</b>      |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| EAM                    | 20°   | +22°      | 198°        | +13°      | —E—         |           | —E—         |           | 0.2934197                 | 1.6                       | 1.1                 |                | Mag+92         |
| C                      | 15°   | +16°      | —C—         |           | —C—         |           | —C—         |           | -----                     |                           |                     |                | Dav+92         |
| EA                     | 19°   | +20°      | ————        |           | —E—         |           | —E—         |           | 0.2934194                 | 1.59                      | 1.10                |                | DeA92          |
| AMF                    | 15°   | +24°      | ————        |           | ————        |           | ————        |           | -----                     | shape <sup>13,12,17</sup> |                     |                | Bar+92         |
| C                      | 19°   | +21°      | —C—         |           | —C—         |           | —C—         |           | -----                     |                           |                     |                | Da+94a         |
| C                      | 19°   | +21°      | —C—         |           | —C—         |           | —C—         |           | -----                     | shape <sup>26</sup>       |                     |                | Tho+94         |
| E C                    |   |           |             |           |             |           |             |           | 0.2934177                 |                           |                     |                | Sim+95         |
| EA                     | 19°   | +20°      | ————        |           | —E—         |           | —E—         |           | 0.2934194                 | 1.75                      | 1.00                |                | DeA95          |
| L <sup>32</sup>        | 20°   | +19°      | ————        |           | ————        |           | ————        |           | 0.2934191                 | shape <sup>31</sup>       |                     |                | Ka+01          |
| EAM                    | 20°   | +26°      | ————        |           | ————        |           | ————        |           | 0.2934170                 | 1.58                      | 1.23                |                | Tun+02         |
| Synthesis              | 19°   | +21°      | ————        |           | ————        |           | ————        |           | 0.293419                  | shape <sup>26</sup>       |                     |                | Synthesis      |
| <b>966 Muschi</b>      |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| L                      | ————  |           | ————        |           |             |           | -57°        |           | -57°                      | 0.223138                  |                     |                | Dur+09         |
| <b>984 Gretia</b>      |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| AM                     | 46°   | +47°      | 48°         | +12°      | 228°        | -12°      | 226°        | -47°      | -----                     | 2.25                      | 1.00                |                | Bla+00         |
| L                      | ————  |           | 245°        | +52°      | ————        |           | ————        |           | 0.2407510                 | shape <sup>31</sup>       |                     |                | Mar+09a        |
| Synthesis              | ————  |           | 245°        | +52°      | ————        |           | ————        |           | 0.2407510                 | shape <sup>31</sup>       |                     |                | Synthesis      |
| <b>1012 Sarema</b>     |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| L                      | 51°   | +64°      | 254°        | +53°      | ————        |           | ————        |           | 0.429462                  | shape <sup>31</sup>       |                     |                | Dur+09         |
| Synthesis              | 51°   | +64°      | 254°        | +53°      | ————        |           | ————        |           | 0.429462                  | shape <sup>31</sup>       |                     |                | Synthesis      |
| <b>1036 Ganymed</b>    |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| E                      | Prograde rotation   |           |             |           |             |           |             |           | 0.42951                   |                           |                     |                | Lu+87b         |
| E                      | Retrograde rotation   |           |             |           |             |           |             |           |                           |                           |                     | Hah+89         |                |
| L                      | ————  |           | ————        |           | ————        |           | 208°        | -76°      | 0.42967                   | 1.0                       | 1.5 <sup>31</sup>   |                | Ka+02a         |
| Synthesis              | ————  |           | ————        |           | ————        |           | 208°        | -76°      | 0.42967                   | 1.0                       | 1.5                 |                | Synthesis      |
| <b>1088 Mitaka</b>     |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| L                      | ————  |           | ————        |           | 115°        | -46°      | 278°        | -72°      | 0.1264740                 | shape <sup>31</sup>       |                     |                | Dur+09         |
| Synthesis              | ————  |           | ————        |           | 115°        | -46°      | 278°        | -72°      | 0.1264740                 | shape <sup>31</sup>       |                     |                | Synthesis      |
| <b>1089 Tama</b>       |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| L                      | ————  |           | ————        |           |             |           | -21°        |           | -21°                      | 0.68606                   |                     |                | Dur+09         |
| <b>1188 Gothlandia</b> |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| L                      | ————  |           | ————        |           |             |           | -52°        |           | -52°                      | 0.1454925                 |                     |                | Dur+09         |
| <b>1207 Ostenia</b>    |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| L                      | ————  |           | ————        |           |             |           | -57°        |           | -57°                      | 0.377970                  |                     |                | Dur+09         |
| <b>1219 Britta</b>     |   |           |             |           |             |           |             |           |                           |                           |                     |                |                |
| E                      | Retrograde rotation   |           |             |           |             |           |             |           | 0.232290                  |                           |                     |                | Bin+87         |

| Basic data             | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |                    |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model  |                     | Albedo varieg. | Reference code |
|------------------------|---|-----------|-------------|--------------------|-------------|-----------|-------------|-----------|---------------------------|--------------------|---------------------|----------------|----------------|
|                        | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$          | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                | b/c                 |                |                |
| <b>1223 Neckar</b>     |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| EAM <sup>32</sup>      | 70°   | +45°      | 225°        | +42°               | —E—         | —E—       |             |           | 0.3232105                 | 1.47               | 1.28                |                | Mic+00         |
| EAM                    | 73°   | +45°      | 258°        | +42°               | —           | —         |             |           | 0.3258850                 | 1.6                | 1.3                 |                | Sli+03         |
| L                      | 73°   | +44°      | 259°        | +41°               | —           | —         |             |           | 0.3258850                 | 1.5                | 1.4                 |                | Sli+03         |
| Synthesis              | 72°   | +45°      | 247°        | +42°               | —           | —         |             |           | 0.3258850                 | 1.5                | 1.3                 |                | Synthesis      |
| <b>1270 Datura</b>     |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| L                      |   | +59°      |             | +59°               | —           | —         |             |           | 0.1399208                 |                    |                     |                | Dur+09         |
| <b>1289 Kuttaissi</b>  |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| EAM                    | —   | —         | 172°        | -74°               | 342°        | -76°      |             |           | 0.15100724                | 1.3                | 1.0                 |                | Sli+09         |
| L                      | —   | —         | 158°        | -79°               | 338°        | -74°      |             |           | 0.15100725                | 1.2                | 1.1                 |                | Sli+09         |
| Synthesis              | —   | —         | 164°        | -76°               | 340°        | -75°      |             |           | 0.15100724                | 1.2                | 1.1                 |                | Synthesis      |
| <b>1514 Ricouxa</b>    |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| L                      |   | +71°      |             | +71°               | —           | —         |             |           | 0.434361                  |                    |                     |                | Dur+09         |
| <b>1566 Icarus</b>     |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| E                      | 49°   | 0°        | 229°        | 0°                 |             |           |             |           | 0.09471                   |                    |                     |                | Geh+70         |
| EA                     |   |           | 214°        | +5°                |             |           |             |           | 0.094735                  | 1.23               | 1.40                |                | DeA95          |
| Synthesis              |   |           | 214°        | +5°                |             |           |             |           | 0.094735                  | 1.23               | 1.40                |                | Synthesis      |
| <b>1572 Posnania</b>   |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| EAM <sup>32</sup>      | —   | —         | 46°         | -65°               | —           | —         |             |           | 0.3353931                 | 1.35               | 1.04                |                | Mic+01         |
| Synthesis              | —   | —         | 46°         | -65°               | —           | —         |             |           | 0.3353931                 | 1.35               | 1.04                |                | Synthesis      |
| <b>1580 Betulia</b>    |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| A                      |   |           | 140°        | +20°               |             | 320°      | -20°        | -----     |                           | 1.21 <sup>10</sup> |                     |                | Ted+78         |
| EAM                    | 80°   | +12°      |             |                    | 212°        | -5°       |             |           | 0.2565                    | 1.7                | 1.4                 |                | Dru+90         |
| L                      | 136°  | +22°      | —           | —                  | —           | —         |             |           | 0.255765                  | 1.1                | 1.4 <sup>31</sup>   |                | Ka+04          |
| R                      | 136°  | +22°      | —           | —                  | —           | —         |             |           | 0.255765                  |                    | shape <sup>30</sup> |                | Mag+07         |
| Synthesis              | 136°  | +22°      | —           | —                  | —           | —         |             |           | 0.255765                  | 1.1                | 1.4                 |                | Synthesis      |
| <b>1620 Geographos</b> |   |           |             |                    |             |           |             |           |                           |                    |                     |                |                |
| E                      |   |           | —E—         | 20°                | -60°        |           |             |           | 0.2176378                 |                    | shape <sup>8</sup>  |                | Dun74          |
| A                      |   |           |             | check <sup>5</sup> |             |           |             | -----     |                           |                    |                     |                | Mi+90b         |
| EAM                    |   |           | —E—         | 15°                | -77°        |           |             |           | 0.2176342                 | 2.7                | 1.05                |                | Kwi94          |
| EAM                    |   |           | —E—         | 15°                | -77°        |           |             |           | 0.2176390                 | 2.7                | 1.05                |                | Kwi94          |
| EAM                    |   |           | —E—         | 54°                | -52°        |           |             |           | 0.21763867                | 2.6                | 1.1                 |                | Mic+94         |
| EA                     |   |           | —E—         | 54°                | -52°        |           |             |           | 0.21763866                | 2.5                | 1.1                 |                | Kwi95          |
| EA                     |   |           | —E—         | 54°                | -52°        |           |             |           | 0.21764381                | 2.5                | 1.1                 |                | Kwi95          |
| EAM                    | —E—   | —E—       | —E—         | 56°                | -47°        | —         | —           |           | 0.21763860                | 2.58               | 1.00                |                | Mag+96         |
| R                      | —   | —         | —           | 55°                | -46°        | —         | —           |           | 0.21763863                | 2.5                | 1.0 <sup>29</sup>   |                | H+O99          |
| L                      | —   | —         | —           | 55°                | -45°        | —         | —           |           | 0.21763858                |                    | shape <sup>31</sup> |                | Ka+01          |
| Synthesis              | —   | —         | —           | 55°                | -46°        | —         | —           |           | 0.21764                   | 2.6                | 1.1                 |                | Synthesis      |

| Basic data               | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                     | Albedo varieg. | Reference code       |
|--------------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|---------------------|----------------|----------------------|
|                          | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c                 |                |                      |
| <b>1627 Ivar</b>         |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| E                        | Prograde rotation   |           |             |           |             |           |             |           | 0.19991                   |                   |                     |                | Lup+86               |
| E                        | 147°  | +13°      | 333°        | +18°      |             |           |             |           | 0.199953                  |                   |                     |                | Ve+89a <sup>23</sup> |
| EA                       | 110°  | +20°      | 320°        | +40°      |             |           |             |           | 0.19995                   |                   |                     |                | Hah+89               |
| E                        | —E—   |           | —E—         |           | 143°        | -37°      |             |           | 0.1999154                 |                   |                     |                | Kis+99               |
| A                        | 145°  | +34°      | 325°        | +34°      | 145°        | -34°      | 325°        | -34°      | -----                     | 2.0               | 1.09                |                | Kis+99               |
| L                        | -----   |           | 333°        | +43°      | -----       |           | -----       |           | 0.1997987                 | 1.9               | 1.3 <sup>31</sup>   |                | Ka+04                |
| Synthesis                | -----   |           | 333°        | +43°      | -----       |           | -----       |           | 0.1997987                 | 1.9               | 1.3                 |                | Synthesis            |
| <b>1685 Toro</b>         |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| EA                       |   |           | 200°        | +55°      | —E—         |           |             |           | 0.42481                   | 3.2               |                     |                | Dun+73               |
| EA                       |   |           | 220°        | +30°      | —E—         |           |             |           | 0.424808                  | 2.08              | 1.80                |                | DeA95                |
| Synthesis                |   |           | 210°        | +43°      | —E—         |           |             |           | 0.424808                  | 2.1               | 1.8                 |                | Synthesis            |
| <b>1862 Apollo</b>       |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| EA                       |   |           | —E—         |           | 56°         | -26°      |             |           | 0.1277265                 |                   |                     |                | Har+87               |
| EA                       |   |           | —E—         |           | 38°         | -36°      |             |           | 0.127754                  | 2.08              | 1.80                |                | DeA95                |
| Synthesis                |   |           | —E—         |           | 47°         | -31°      |             |           | 0.127754                  | 2.08              | 1.80                |                | Synthesis            |
| <b>1980 Tezcatlipoca</b> |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| L                        | -----   |           | -----       |           | -----       |           | 334°        | -66°      | 0.302177                  | 1.4               | 1.4 <sup>31</sup>   |                | Ka+04                |
| Synthesis                | -----   |           | -----       |           | -----       |           | 334°        | -66°      | 0.302177                  | 1.4               | 1.4                 |                | Synthesis            |
| <b>2063 Bacchus</b>      |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| R                        |   |           |             |           | 24°         | -26°      |             |           | 0.652                     |                   | shape <sup>30</sup> |                | Ben+99               |
| Synthesis                |   |           |             |           | 24°         | -26°      |             |           | 0.652                     |                   | shape <sup>30</sup> |                | Synthesis            |
| <b>2100 Ra-Shalom</b>    |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| L                        | 73°   | +13°      | -----       |           | -----       |           | -----       |           | 0.824992                  | 1.2               | 1.3 <sup>31</sup>   |                | Ka+04                |
| Synthesis                | 73°   | +13°      | -----       |           | -----       |           | -----       |           | 0.824992                  | 1.2               | 1.3                 |                | Synthesis            |
| <b>3103 Eger</b>         |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| E                        | Prograde rotation   |           |             |           |             |           |             |           | 0.2377819                 |                   |                     |                | Vel+92               |
| L                        | -----   |           | -----       |           | 10°         | -50°      | -----       |           | 0.23778217                | 1.5               | 1 <sup>31</sup>     |                | Ka+02a               |
| Synthesis                | -----   |           | -----       |           | 10°         | -50°      | -----       |           | 0.23778217                | 1.5               | 1                   |                | Synthesis            |
| <b>3199 Nefertiti</b>    |   |           |             |           |             |           |             |           |                           |                   |                     |                |                      |
| L                        | -----   |           | -----       |           | -----       |           | 197°        | -22°      | 0.12584029                | 1.1               | 1.1 <sup>31</sup>   |                | Ka+04                |
| Synthesis                | -----   |           | -----       |           | -----       |           | 197°        | -22°      | 0.12584029                | 1.1               | 1.1                 |                | Synthesis            |



| Basic data              | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model |                     | Albedo varieg. | Reference code |
|-------------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|-------------------|---------------------|----------------|----------------|
|                         | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b               | b/c                 |                |                |
| <b>3200 Phaeton</b>     |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| EAM                     | —E—   | —E—       | 97°         | -11°      | 276°        | -15°      |             |           | 0.1496080 <sup>2</sup>    |                   |                     |                | Kru+02         |
| Synthesis               | —E—   | —E—       | 97°         | -11°      | 276°        | -15°      |             |           | 0.1496080                 |                   |                     |                | Synthesis      |
| <b>3908 Nyx</b>         |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| EAM                     | 177° +23°   | 312° +61° | —E—         |           | —E—         |           |             |           | 0.18441                   | 1.3               | 1.2 <sup>2</sup>    |                | Dru+90         |
| R                       | 43° +71°  |           | —           |           | —           |           |             |           |                           |                   | shape <sup>30</sup> |                | Ben+02         |
| L                       |   | 291° +69° | —           |           | —           |           |             |           | 0.1844208                 | 1.2               | 1.0 <sup>31</sup>   |                | Ka+04          |
| Synthesis               | 43° +71°  | 291° +69° | —           |           | —           |           |             |           | 0.1844208                 | 1.2               | 1.0                 |                | Synthesis      |
| <b>4179 Toutatis</b>    |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| R                       |   |           | Precessing  |           |             |           |             |           | -----                     | 2.10              | 1.35 <sup>29</sup>  |                | H+O95          |
| <b>4660 Nereus</b>      |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| R                       | 25° +80°  | —         | —           |           | —           |           |             |           | 0.631                     | 1.55              | 1.37                |                | Bro+09         |
| Synthesis               | 25° +80°  | —         | —           |           | —           |           |             |           | 0.631                     | 1.55              | 1.37                |                | Synthesis      |
| <b>4769 Castalia</b>    |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| R                       |   |           |             |           |             |           | 253° -56°   |           | 0.17038                   |                   |                     |                | Hud+97         |
| R                       |   |           |             | 62° -7°   |             |           |             |           | 0.17058                   |                   |                     |                | Hud+97         |
| EAM                     |   |           |             |           |             |           | 253° -56°   |           | 0.17038                   |                   |                     |                | Eri+00         |
| EAM                     |   | 242° +7°  |             |           |             |           |             |           | 0.17058                   |                   |                     |                | Eri+00         |
| Synthesis               | —   | —         | —           |           | —           |           | 235° -56°   |           | 0.17058                   |                   |                     |                | Synthesis      |
| <b>4957 Brucemurray</b> |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| L                       | —   | —         | —           |           | —           |           | 358° -50°   |           | 0.120510                  | 1.1               | 1.1 <sup>31</sup>   |                | Ka+04          |
| Synthesis               | —   | —         | —           |           | —           |           | 358° -50°   |           | 0.120510                  | 1.1               | 1.1                 |                | Synthesis      |
| <b>4979 Otawara</b>     |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| EAM                     | —   | —         | 50° -30°    |           | —           |           |             |           | 0.112776                  | 1.21              |                     |                | For+03         |
| Synthesis               | —   | —         | 50° -30°    |           | —           |           |             |           | 0.112776                  | 1.2               |                     |                | Synthesis      |
| <b>5145 Pholus</b>      |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| EAM                     | 149° +26°   |           |             |           |             |           | 337° -5°    |           | 0.4159256                 | 1.8               | 1.0                 |                | Far+01         |
| <b>5587 1990 SB</b>     |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| L                       | —   | —         | —           |           | —           |           | 253° -60°   |           | 0.210508                  | 2.0               | 1.2 <sup>31</sup>   |                | Ka+04          |
| Synthesis               | —   | —         | —           |           | —           |           | 253° -60°   |           | 0.210508                  | 2.0               | 1.2                 |                | Synthesis      |
| <b>6053 1993 BW3</b>    |   |           |             |           |             |           |             |           |                           |                   |                     |                |                |
| E                       | —E—   | —E—       | 175° -9°    |           | 359° -26°   |           |             |           | 0.107238 <sup>2</sup>     | 1.08              | 1.5                 |                | Pra+97         |
| L                       | 178° +10°   | —         | —           |           | 358° -8°    |           |             |           | 0.107246                  | 1.1               | 1.6 <sup>31</sup>   |                | Ka+02a         |
| L                       | —   | —         | 180° -6°    |           | 345° -14°   |           |             |           | 0.107238 <sup>2</sup>     |                   | shape <sup>31</sup> |                | Dur02          |
| Synthesis               | —   | —         | 178° -7°    |           | 354° -16°   |           |             |           | 0.10723                   | 1                 | 1.5                 |                | Synthesis      |

| Basic data             | Spin vector solutions<br>(ecliptic coordinates of equinox 1950) |           |             |           |             |           |             |           | Sidereal period<br>(days) | Ellipsoidal model   |                      | Albedo varieg.  | Reference code |
|------------------------|---|-----------|-------------|-----------|-------------|-----------|-------------|-----------|---------------------------|---------------------|----------------------|-----------------|----------------|
|                        | $\lambda_0$   | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ | $\lambda_0$ | $\beta_0$ |                           | a/b                 | b/c                  |                 |                |
| <b>6489 Golevka</b>    |   |           |             |           |             |           |             |           |                           |                     |                      |                 |                |
| EA <sup>32</sup>       |   |           | 345°        | +45°      |             |           |             |           | 0.25109                   | 1.25                |                      |                 | Mot+97         |
| EA <sup>32</sup>       |   |           | 350°        | +25°      |             |           |             |           | 0.25111                   | 1.6                 | 0.7                  | X <sup>35</sup> | Mot+97         |
| EA <sup>32</sup>       |   |           |             |           | 190°        | -55°      |             |           | 0.25123                   | 1.25                |                      |                 | Mot+97         |
| EA <sup>32</sup>       |   |           |             |           | 200°        | -55°      |             |           | 0.25125                   | 1.6                 | 1.2                  | X <sup>35</sup> | Mot+97         |
| R                      | ————  | ————      | ————        | ————      | 202°        | -45°      |             |           | 0.251204                  | 1.01                | 1.0 <sup>29,30</sup> |                 | Hud+00         |
| L                      | ————  | ————      | ————        | ————      | 208°        | -47°      |             |           | 0.251238                  | shape <sup>31</sup> |                      |                 | Ka+01          |
| Synthesis              | ————  | ————      | ————        | ————      | 205°        | -46°      |             |           | 0.25122                   | 1.0                 | 1.0                  |                 | Synthesis      |
| <b>9969 Braille</b>    |   |           |             |           |             |           |             |           |                           |                     |                      |                 |                |
| C                      | ————  |           | 314°        | +65°      | ————        | ————      |             |           | -----                     | 2.1                 | 1.0                  |                 | Ob+01          |
| <b>10115 1992 SK</b>   |   |           |             |           |             |           |             |           |                           |                     |                      |                 |                |
| RL                     | ————  | ————      |             |           | 99°         | -3°       | ————        |           | 0.30493                   | shape <sup>30</sup> |                      |                 | Bus+06         |
| Synthesis              | ————  | ————      |             |           | 99°         | -3°       | ————        |           | 0.30493                   | shape <sup>30</sup> |                      |                 | Synthesis      |
| <b>25143 Itokawa</b>   |   |           |             |           |             |           |             |           |                           |                     |                      |                 |                |
| L                      | ————  | ————      | ————        | ————      | 355°        | -84°      |             |           | 0.50550                   | 2.0                 | 1.3 <sup>31</sup>    |                 | Ka+03          |
| EA                     | ————  | ————      |             |           | 39°         | -87°      | ————        |           | 0.50550                   | 1.9                 | 1.2                  |                 | Ka+03          |
| EA                     | ————  | ————      | ————        | ————      | 320°        | -75°      | ————        |           | -----                     | 2.13                | 1.68                 |                 | Oh+03          |
| C                      | ————  | ————      |             |           | 128°        | -89°      | ————        |           | -----                     | 1.82                | 1.41 <sup>37</sup>   |                 | De+06          |
| Synthesis              | ————  | ————      |             |           | -88°        | 355°      | -84°        |           | 0.50550                   | 1.9                 | 1.3 <sup>38</sup>    |                 | Synthesis      |
| <b>29075 1950 DA</b>   |   |           |             |           |             |           |             |           |                           |                     |                      |                 |                |
| R                      | 89°   | +78°      | ————        | ————      | 187°        | -89°      | ————        |           | -----                     | shape <sup>30</sup> |                      |                 | Bus+07         |
| <b>33342 1998 WT24</b> |   |           |             |           |             |           |             |           |                           |                     |                      |                 |                |
| T                      | 175°  | +52°      |             |           | 355°        | -52°      | ————        |           | -----                     | 39                  |                      |                 | Har+07         |
| R                      | ————  | ————      |             |           | 15°         | -22°      | ————        |           | 0.1540416                 | 1.09                | 1.10 <sup>29</sup>   |                 | Bus+08         |
| Synthesis              | ————  | ————      |             |           | 15°         | -22°      | ————        |           | 0.1540416                 | 1.09                | 1.10                 |                 | Synthesis      |

**Footnotes:**

- <sup>1</sup> Assumed value.
- <sup>2</sup> Mean value of two significantly different solutions.
- <sup>3</sup> Different spin axis solutions for different apparitions was interpreted as indicating a precessing motion.
- <sup>4</sup> Symmetric solution obtained, but quantitative specification is missing.
- <sup>5</sup> Consistency check of previous spin vector determinations.
- <sup>6</sup> Based on a radar experiment giving constraints on the aspect angle at the time of observation.
- <sup>7</sup> Based on two radar experiments giving an aspect circle at the time of observation.
- <sup>8</sup> Modelled as a cylinder with hemispherical ends.
- <sup>9</sup> Modelled as a cylinder cut out of a sphere.
- <sup>10</sup> Complex shape.
- <sup>11</sup> Modelled as a Jacobi ellipsoid.
- <sup>12</sup> Modelled as 8 octants of ellipsoids put together to form a continuous surface.
- <sup>13</sup> Modelled as an ellipsoid with a piece removed by a plane cut.
- <sup>14</sup> Modelled as an irregular polyhedron.
- <sup>15</sup> Modelled as a sphere with free albedo facets.

16 Results show that there is no significant albedo variegation.  
17 Modelled using a spherical harmonics expansion of the shape.  
18 Albedo model with a single big spot.  
19 Modelled as a sphere with 2 dark regions.  
20 Speckle images showing albedo variegation.  
21 Bi-axial ellipsoid ( $a/b=1.15$ ) with a flat region just off the South Pole.  
22 Also presented in Ful+91.  
23 Also presented in English in Lup+90.  
24 Also presented in Mi+90c.  
25 Also presented in Det+94.  
26 Detailed model from space images.  
27 Also presented in Mic94.  
28 The spin axis is not aligned with the c-axis of the ellipsoid model.  
29 DEEVE - dynamicaly equivalent equal volume ellipsoid adopted for the complex shape.  
30 Complex radar model.  
31 Convex shape obtained with lightcurve inversion.  
32 Pole coordinates calculated for J2000.  
33 Values for pole coordinates in the paper are 17.238, 11.351  
34 Also presented in Bla+98.  
35 Model requires albedo variegation  
36 Suggested albedo variegations of 4%  
37 Values for pole coordinates in the paper are 128.5, -89.66  
38 Because of latitude close to 90 deg, longitude is ambiguous  
39 Crude approximation of the spin axis orientation