Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0 β_0	λ_0 β_0	λ_0 β_0	λ_0 β_0	Sidereal period (days)	Ellipsoidal model a/b b/c	Albedo varieg.	Reference code
1 Ceres								
I	Prograde rotation				- - - - -			Mor77
I	Prograde rotation				- - - - -			Han77
P		270° +36°	—P—		- - - - -			Joh+83
R		Concentric ring region[6]			- - - - -			Ost87
S	—S—	332° +70°	—S—	—S—	- - - - -			Sai+93
S		298° +78°		186° −58°	- - - - -	1.08 1.06	X[36]	Dru+98
Synthesis		315° +74°			- - - - -	1.08 1.06		Synthesis
2 Pallas								
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[1]		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[1]		Bur+85
R		Aspect circle[7]			- - - - -			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[6]			- - - - -			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[31]		Tor+03
Synthesis			44° −9°		0.325551	1.1 1.05		Synthesis
3 Juno								
EA	71° +49°			—E—	0.3004950			Cha+62
AM	101° +29°	321° +57°	141° −57°	281° −29°	- - - - -	1.23 1.0[1]		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[2]		Eri+93
EA	108° +38°	————	—E—	—E—	0.3003970	1.20 1.26		Dot+95
L	103° +27°	————	————	————	0.3003971	1.2 1.3[31]		Ka+02a
Synthesis	106° +34°	————	—E—	—E—	0.3003970	1.2 1.3		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
4 Vesta													
EA	14°	+80°					—E—		0.2227006				Cai56
EA	—E—		—E—		−90°		−90°		0.4453666	1.14	1.0[1]		Hau58
EA	57°	+74°					—E—		0.2225884				Cha+62
E	126°	+65°			—E—		—E—		0.22258871				Geh67
E	139°	+47°	333°	+39°	—E—		—E—		0.4451021	shape[21]			Tay73
I	Prograde rotation								- - - - -				Mor77
I	Prograde rotation								- - - - -				Han77
E	103°	+43°	301°	+33°	—E—		—E—		0.2225889				Tay+85
E	120°	+65°	325°	+55°	—E—		—E—		0.22258849	1.01	1.4[2]		Mag86
AM	85°	+58°	310°	+60°					- - - - -	1.0[1]	1.27	X[18]	Cel+87
SE	—S—		336°	+55°					0.2225887	1.10	1.14	X[20]	Dr+88a
S	—S—		311°	+67°	—S—		—S—		- - - - -	1.07	1.14		Dr+89a
EA	160°	+52°	340°	+40°	—E—		—E—		0.2225885				Rey+93
S	———		343°	+56°	———		———		- - - - -	1.06	1.15		McC+94
S	—S—		336°	+63°	—S—		—S—		- - - - -	1.03	1.2		Tho+97
S	———		321°	+62°	———		———		- - - - -	1.05	1.26		Dru+98
Synthesis	—S—		325°	+55°	—ES—		—ES—		0.2225886	1.1	1.2		Synthesis
5 Astraea													
E							328°	−9°	0.7005047				Tay78
AM	131°	+49°	328°	+46°	148°	−46°	310°	−49°	- - - - -	1.29	1.0[1]		Za+86b
R			Concentric ring region[6]						- - - - -				Ost87
EA	125°	+46°	318°	+44°	—E—		—E—		0.700026	1.27			Eri+93
EA	114°	+57°			—E—		—E—		0.700026	1.21	1.15		DeA95
AM			312°	+58°	132°	−58°			- - - - -	1.44	1.30		Bla+00
Synthesis	123°	+51°	319°	+49°	—E—		—E—		0.700026	1.3	1.15		Synthesis
6 Hebe													
A	145°	+15°					—E—		- - - - -				Geh+62
E			365°	+50°					0.3031020	1.15	1.0[1]		Geh+77
AM	130°	+33°	344°	+30°	164°	−30°	310°	−33°	- - - - -	1.24	1.0[1]		Zap+84
OEA	—O—		355°	+50°	—E—		—E—		0.3031025	1.14	1.2		Mag86
R			Concentric ring region[6]						- - - - -				Ost87
E			363°	+60°	—E—		—E—		0.3031024				Mic88
EA			365°	+27°	—E—		—E—		0.3031023	1.13	1.06		DeA95
EA	—O—		353°	+24°	—E—		—E—		0.3031026	1.14	1.00		Dot+95
EA			check[5]						- - - - -				Lag+95
AM	128°	+30°					308°	−30°	- - - - -	1.32	1.11		Bla+00
L	———		339°	+45°	———		———		0.3031029	1.1	1.1[31]		Tor+03
Synthesis	—O—		355°	+41°	—E—		—E—		0.3031026	1.17	1.1		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
7 Iris													
EA			184°	+55°	—E—				0.2967853	shape[9]			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[6]						- - - - -				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[31]		Ka+02a
Synthesis	15°	+28°	196°	+10°	—E—		—E—		0.2974519	1.2	1.2		Synthesis
8 Flora													
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[31]		Tor+03
Synthesis	140°	+22°	———		———		———		0.533292	1.05	1.2		Synthesis
9 Metis													
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[6]						- - - - -				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[31]		Tor+03
Synthesis	182°	+26°	360°	+11°	—E—		—E—		0.2116324	1.3	1.3		Synthesis
10 Hygiea													
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	1.444		Bla+98
L	———		———		115°	−30°	300°	−30°	1.150967	1.3	1.1 [31]		Ka+02a
Synthesis	—E—		—E—		111°	−36°	298°	−37°	1.15097	1.29	1.1		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
11 Parthenope													
AM	64°	+38°	253°	+51°	73°	−51°	244°	−38°	- - - - -	1.225	1.208		Bla+98
12 Victoria													
A			242°	+17°	62°	−17°			0.36060				Tem+69
R			Concentric ring region[6]						- - - - -				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[31]		Tor+03
Synthesis	———		150°	+50°	—E—		—E—		0.36085	1.3	1.2		Synthesis
13 Egeria													
AM	103°	+13°					283°	−13°	- - - - -	1.43	1.26		Bla+00
14 Irene													
AM			270°	+34°	90°	−34°			- - - - -	1.148	1.080		Bla+98
15 Eunomia													
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[1]		Pii+85
A	170°	+57°	———		———		350°	−57°	- - - - -	1.6	1.4[1]		Pii+85
E	Prograde rotation				—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 [31]		Ka+02a
Synthesis	—E—		—E—		106°	−74°	353°	−60°	0.25344808	1.42	1.1		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0 β_0	λ_0 β_0	λ_0 β_0	λ_0 β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
16 Psyche									
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[6]			- - - - -				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[2]	1.36		DeA93
L	————	————	35° −9°	216° −2°	0.17483113	1.2	1.2[31]		Ka+02a
Synthesis	—E—	—E—	35° −15°	216° −10°	0.1748311	1.25	1.25		Synthesis
17 Thetis									
AM	69° +43°	268° +55°	88° −55°	249° −43°	- - - - -	1.25	1.35[1]		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[31]		Tor+03
Synthesis	58° +12°	240° +25°	————	————	0.5110845	1.3	1.0		Synthesis
18 Melpomene									
EA	—E—	—E—	0° −0°	341° −36°	0.482218				Hof+90
L	————	————	199° −24°	8° −37°	0.482142	1.2	1.2[31]		Tor+03
Synthesis	————	————	190° −20°	355° −37°	0.482142	1.2	1.2		Synthesis
19 Fortuna									
I	Prograde rotation				- - - - -				Mor77
I	Prograde rotation				- - - - -				Han77
E	Prograde rotation		—E—	—E—	0.310125				Lup+85
R		Concentric ring region[6]			- - - - -				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[31]		Tor+03
Synthesis	80° +52°	260° +52°	—E—	—E—	0.3101342	1.2	1.0		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
20 Massalia													
A	10°	+78°					190°	−78°	- - - - -				Cha+62
AM	30°	+49°	207°	+51°	27°	−51°	210°	−49°	- - - - -	1.27	1.0[1]		Bar+85
A	30°	+54°	205°	+79°	25°	−79°	210°	−54°	- - - - -	1.25	2.4[2]		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 [31]		Ka+02a
Synthesis	23°	+59°	203°	+60°	—E—		—E—		0.337399	1.15	1.1		Synthesis
21 Lutetia													
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[2]		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
L	39°	+3°	220°	+3°	———		———		0.3402272	1.2	1.2[31]		Tor+03
Synthesis	42°	+10°	225°	+10°	—E—		—E—		0.34025	1.25	1.2		Synthesis
22 Kalliope													
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—						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[31]		Ka+02a
Synthesis	—E—		—E—		21°	−22°	193°	0°	0.1728416	1.3	1.2		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
23 Thalia													
A D			Solution curve						- - - - -	1.15[2]			Tan+91
EAM	198°	+72°	354°	+47°	—E—		—E—		0.5133960	1.18	1.45		Mic93
EA	—E—		—E—		15°	−55°	180°	−35°	0.513202	1.28			Lag+95
L	———		———		359°	−55°	———		0.5130	1.1	1.3[31]		Tor+03
Synthesis	—E—		—E—		7°	−55°	———		0.5131	1.2	1.3		Synthesis
24 Themis													
AM			274°	+52°	94°	−52°			- - - - -	1.191	1.148		Bla+98
26 Proserpina													
AM	47°	0°	227°	+4°	47°	−4°	227°	0°	- - - - -	1.16	1.40		Bla+00
28 Bellona													
AM	93°	+18°	285°	+37°	105°	−37°	273°	−18°	- - - - -	1.31	1.18		Zap+84
EAM	73°	+17°	265°	+43°	—E—		—E—		- - - - -	1.24	1.20		Mic93
Synthesis	83°	+18°	275°	+40°	—E—		—E—		- - - - -	1.2	1.2		Synthesis
29 Amphitrite													
A	165°	+45°	345°	+45°	165°	−45°	345°	−45°	- - - - -	1.14	1.0[1]		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[1]		Zap+84
EAM	—E—		—E—		135°	−15°	320°	−25°	0.22458835	1.06	1.06		Mag86
EAM	—E—		—E—		136°	−33°	———		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	———		———		138°	−21°	———		0.22458829	1.1	1.1[31]		Ka+02a
Synthesis	—ES—		—ES—		136°	−28°	—S—		0.2245883	1.1	1.1		Synthesis
30 Urania													
EAM	114°	+34°	293°	+33°					- - - - -	1.5	1.1		Mic96a
31 Euphrosyne													
AM	186°	+67°	317°	+4°	137°	−4°	6°	−67°	- - - - -	1.12	1.0[1]		Bar+85
A	178°	+72°	315°	+5°	135°	−5°	358°	−72°	- - - - -	1.12	1.00		McC+85
EAM	—E—		—E—		126°	−31°	———		0.2316828	1.14	1.59		Mic93
A D	300°	+75°	282°	+30°	102°	−30°	120°	−75°	- - - - -	1.08			Lic+94
EAM	—E—		—E—		———		273°	−60°	0.2304828	1.09	1.60		Kry+96
Synthesis	—E—		—E—		———		273°	−60°	0.2304828	1.09	1.60		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
32 Pomona													
AM	91°	+34°	263°	+46°	83°	−46°	271°	−34°	- - - - -	1.34	1.0[1]		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 [31]		Ka+02a
Synthesis	92°	+45°	262°	+58°	—E—		—E—		0.393653	1.3	1.3		Synthesis
34 Circe													
AM	113°	+17°					293°	−17°	- - - - -	1.32	1.00		Bla+00
36 Atalante													
AM			299°	+19°	119°	−19°			- - - - -	1.282	1.000		Bla+98
37 Fides													
EA	100°	+5°	280°	−5°					0.305573	1.2			Mag86
L	———		———		85°	−26°	264°	−34°	0.3055622	1.1	1.05[31]		Tor+03
Synthesis	———		———		85°	−26°	264°	−34°	0.3055622	1.1	1.05		Synthesis
39 Laetitia													
EA	—E—						280°	−66°	0.2144712	shape[9]			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[2]		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[2]		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[16]	Lum+91
EA			325°	+23°	—E—		—E—		0.21409327	1.42	1.10		DeA95
L	———		323°	+35°	———		———		0.21409321	1.4	1.4[31]		Ka+02a
Synthesis	———		324°	+31°	—E—		—E—		0.2140932	1.4	1.4		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
40 Harmonia													
A D			Solution curve						- - - - -	1.31[2]			Tan+91
EAM	————		208°	+21°	—E—		—E—		0.3712522	1.24	2.07		Mic93
EA	22°	+28°	203°	+38°	————		————		0.3711872	1.31	1.0		LGR99
EA	12°	+34°	201°	+41°	————		————		0.3712535	1.31	1.0		LGR99
Synthesis	17°	+31°	204°	+33°	————		————		0.37123	1.3	1.0		Synthesis
41 Daphne													
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[1]		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[6]						- - - - -				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[31]			Ka+02
Synthesis	—E—		—E—		194°	−31°	342°	−34°	0.2494994	1.3	1.1		Synthesis
42 Isis													
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[31]		Tor+03
Synthesis	————		————		119°	−18°	291°	−20°	0.566542	1.1	1.0		Synthesis
43 Ariadne													
A	73°	+40°	249°	+43°	69°	−43°	253°	−40°	- - - - -	1.69	1.8[2]		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[25]
EAMD			250°	+1°	70°	−1°			- - - - -	1.0[1]	1.0[1]	X[15]	Det+92[25]
EAMD	73°	+25°	248°	+20°	68°	−20°	253°	−25°	- - - - -	shape[14]			Det+92[25]
EAMD	70°	+5°					250°	−5°	- - - - -	shape[14]			Det+92[25]
E	—E—		—E—		70°	−22°	254°	−24°	0.24008258				Det+92[25]
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[31]		Ka+02a
Synthesis	—E—		—E—		————		252°	−16°	0.240082	1.6	1.15		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0 β_0	λ_0 β_0	λ_0 β_0	λ_0 β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
44 Nysa									
EA		—E—	178° −84°		0.26737846	shape[9]			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[31]			Ka+02
Synthesis	100° +53°	296° +52°	—E—	—E—	0.26755903	1.4	1.2		Synthesis
45 Eugenia									
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[2]			Tan+91
EA	—E—	—E—	109° −27°		0.2374650	1.33	1.23		DeA95
EA		check[5]			- - - - -				Lag+95
EA	———	———	106° −42°	313° −41°	0.2374644	1.33	1.4		LGR99
L	———	———	124° −30°	———	0.23746429	1.4	1.5[31]		Ka+02a
Synthesis	—E—	—E—	119° −34°	301° −27°	0.2374647	1.4	1.5		Synthesis
47 Aglaja									
EAM	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
48 Doris									
AM	113° +27°			293° −27°	- - - - -	1.445	1.000		Bla+98
51 Nemausa									
E F	—E—	—E—	133° −61°	?[4]	0.324368				Kri91
E F	—E—	—E—	166° −62°	?[4]	- - - - -				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
52 Europa									
A	0° +37°	203° +38°	23° −38°	180° −37°	- - - - -	1.12	1.0[1]		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[31]		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[31]		Mic+04
Synthesis	69° +28°	258° +42°	———	———	0.2345815	1.2	1.2		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
54 Alexandra													
A D			Solution curve						- - - - -	1.3[2]			Tan+91
EA	160°	+45°	290°	+55°	—E—		—E—		0.292766				Bel+93
Synthesis	160°	+45°	290°	+55°	—E—		—E—		0.292766	1.3	1.0		Synthesis
55 Pandora													
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[31]		Tor+03
Synthesis	30°	+38°	228°	+27°	———		———		0.2001685	1.25	1.2		Synthesis
60 Echo													
EAM	95°	+34°	275°	+42°	—E—		—E—		1.048226	1.50[2]	1.38		Mic93
Synthesis	95°	+34°	275°	+42°	—E—		—E—		1.048226	1.5	1.4		Synthesis
63 Ausonia													
AM	130°		310°		130°		310°		- - - - -	2.4	1.0		Zap+83
AM	127°	+38°	298°	+28°	118°	−28°	307°	−38°	- - - - -	2.25	1.0[1]		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[31]		Tor+03
Synthesis	—E—		—E—		120°	−27°	308°	−34°	0.3874027	2.1	1.0		Synthesis
64 Angelina													
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
65 Cybele													
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	1.6		Synthesis
66 Maja													
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 (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
69 Hesperia													
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[31]		Tor+03
71 Niobe													
AM			274°	+14°	94°	−14°			- - - - -	1.202	1.345		Bla+98
75 Eurydike													
EAM			253°	+30°					0.2231746	1.19	1.60		Tun+02
77 Frigga													
AM	57°	+39°					236°	−40°	- - - - -	1.224	1.010		Bla+98
79 Eurynome													
EA	64°	+45°	226°	+52°	—E—		—E—		0.2490706	1.28	2.0[2]		Mi+90a[24]
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
80 Sappho													
R			Concentric ring region[6]						- - - - -				Ost87
83 Beatrix													
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
85 Io													
EA	120°	+89°	303°	+82°	123°	−82°	300°	−89°	- - - - -	1.18	1.00		Dot+95
EAM[32]	—E—		—E—		—E—		285°	−52°	0.28646325	1.15	1.8		Eri+99
EAM[32]	—E—		—E—		108°	−46°	290°	−16°	0.2864629	1.19			Eri+99
L	———		———		105°	−45°	295°	−14°	0.2864629	1.1	1.0[31]		Tor+03
Synthesis	—E—		—E—		106°	−46°	293°	−15°	0.28646325	1.1	1.0		Synthesis
87 Sylvia													
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[2]		Mic93
EA	86°	+45°			—E—		—E—		0.2159850	1.45	1.05		DeA95
L	71°	+66°	———		———		———		0.21598508	1.4	1.1[31]		Ka+02a
Synthesis	82°	+55°	———		—E—		—E—		0.2159853	1.4	1.1		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
88 Thisbe													
AM	32°	+69°	205°	+54°	25°	−54°	212°	−69°	- - - - -	1.13	1.0[1]		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[31]		Tor+03
Synthesis			190°	+64°	—E—		—E—		0.25172	1.1	1.2		Synthesis
93 Minerva													
EA	———		203°	+15°	———		———		0.249087	1.07	1.10		Eri00
EAM	———		189°	+10°	———		———		0.2491288	1.12	1.00		Tun+02
Synthesis	———		196°	+13°	———		———		0.2491	1.10	1.05		Synthesis
97 Klotho													
EAM			340°	+8°					1.4632286	1.33	1.10		Tun+02
105 Artemis													
EAM			192°	+68°					0.7729158	1.09	1.53		Tun+02
107 Camilla													
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°	—E—		—E—		0.2018306	1.4	1.5		Synthesis
108 Hecuba													
AM	79°	+13°					259°	−13°	- - - - -	1.180	1.101		Bla+98
AM	79°	+6°					259°	−6°	- - - - -	1.180	1.101		Bla+98
110 Lydia													
EAM	24°	+75°	210°	+78°					- - - - -	1.17			Mic96a
113 Amalthea													
EAM					70°	−18°			0.4140702	1.45	1.17		Tun+02
115 Thyra													
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[31]		Mic+04
Synthesis	15°	+34°	———		———		———		0.30169	1.2	1		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
119 Althaea													
EAM					21°	−77°			0.4783486	1.29	1.33		Tun+02
121 Hermione													
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
125 Liberatrix													
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
Synthesis	48°	+64°	205°	+65°	—E—		—E—		0.1653422	1.45	1.16		Synthesis
129 Antigone													
AM	331°	+30°	133°	+48°	313°	−48°	151°	−30°	- - - - -	1.37	1.0[1]		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[31]		Tor+03
Synthesis	———		200°	+65°	—E—		—E—		0.2065484	1.3	1.04		Synthesis
130 Elektra													
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
Synthesis	—E—		—E—		190°	−84°	243°	−36°	0.2176946	1.4	1.2		Synthesis
133 Cyrene													
E	Prograde rotation				—E—		—E—		0.5295				Har+84
135 Hertha													
A D	Solution curve								- - - - -	1.23			Tan+91
AM	135°	+46°	310°	+43°	130°	−43°	315°	−46°	- - - - -	1.34	1.22		Dot+92[22]
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[31]		Tor+03
Synthesis	100°	+52°	292°	+50°	———		———		0.350238	1.15	1.2		Synthesis
137 Meliboea													
AM	149°	+8°					329°	−8°	- - - - -	1.18	1.11		Bla+00

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
139 Juewa													
EAM	117°	+50°	———		—E—		—E—		- - - - -	1.21	1.68		Mic93
144 Vibilia													
R			Concentric ring region[6]						- - - - -				Ost87
150 Nuwa													
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
158 Koronis													
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	1.45	1.6		Synthesis
161 Athor													
AM	1°	+48°	209°	+47°	29°	−47°	181°	−48°	- - - - -	1.367	0.850		Bla+98
165 Loreley													
AM			339°	+65°	159°	−65°			- - - - -	1.191	1.274		Bla+98
167 Urda													
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	1.25	1.0		Synthesis
173 Ino													
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[31]		Mic+05
Synthesis	—E—		—E—		178°	−14°	344°	−30°	0.2548546	1.1	1.1		Synthesis
176 Iduna													
AM	85°	+36°					265°	−36°	- - - - -	1.39	1.28		Bla+00
192 Nausikaa													
A	130°	+40°					310°	−40°	- - - - -				Sc+76a
EA	—E—		—E—		———		325°	−45°	0.567670	1.35	1.50		Dot+95
L	131°	+36°	———		———		306°	−7°	0.5676058	1.3	1.1 [31]		Ka+02a

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0 β_0	λ_0 β_0	λ_0 β_0	λ_0 β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
196 Philomela									
EAM	78° +26°	266° +24°	86° −24°	258° −26°	- - - - -	1.58	1.06		Mic92
EAM	—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[2]	1.32	1.16		Kry+96
AM		278° +20°	98° −20°		- - - - -	1.472	0.914		Bla+98
Synthesis	————	277° +20°	—E—	—E—	0.3475556	1.3	1.2		Synthesis
201 Penelope									
EAM	78° −3°	258° +4°			0.1561283[2]	1.47	1.22		Dr+88b
EAM	—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—	85° −40°	260° −25°	0.1561439	1.42	1.3		Eri+93
EAM	—E—	—E—	————	258° −22°	0.1561433	1.32	1.06		Mic93
EA	—E—	—E—	93° −14°	————	0.15614438	1.65	1.20		DeA95
EAM	—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[31]		Tor+03
Synthesis	—E—	—E—	85° −29°	260° −21°	0.1561439	1.5	1.2		Synthesis
208 Lacrimosa									
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	1.35	1.7		Synthesis
216 Kleopatra									
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[2]		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
218 Bianca									
EAM		340° +60°			- - - - -	1.20	1.33		Kry+96

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
225 Henrietta													
EAM	—E—		—E—		———		241°	−56°	- - - - -	1.27	1.89		Mic93
EAM	135°	+13°							- - - - -	1.23	1.08		Mic+00
230 Athamantis													
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[31]		Tor+03
Synthesis	83°	+36°	239°	+40°	———		———		0.999354	1.1	1.1		Synthesis
236 Honoria													
AM			358°	+66°	178°	−66°			- - - - -	1.224	1.142		Bla+96[34]
238 Hypatia													
EA	139°	+27°	337°	+50°	157°	−50°	319°	−27°	- - - - -	1.38	1.00		DeA95
243 Ida													
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[27]
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[31]			Ka+01
Synthesis	—C—		—C—		—C—		262°	−68°	0.1930680	1.8	1.2		Synthesis
250 Bettina													
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[22]
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[5]						- - - - -				Lag+95
AM			275°	+1°	95°	−1°			- - - - -	1.74	1.58		Bla+00
L	100°	+17°	———		———		282°	−12°	0.2106006	1.3	1.0[31]		Tor+03
258 Tyche													
AM	72°	+20°	222°	+40°	42°	−40°	252°	−20°	- - - - -	1.51	1.25		Bla+00
270 Anahitia													
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

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
277 Elvira													
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
Synthesis	———		———		53°	−79°	245°	−78°	1.2371729	1.4	1.5		Synthesis
281 Lucretia													
A		+90°		+90°		−90°		−90°	- - - - -				Tay+76
287 Nephthys													
AM	99°	+54°					279°	−54°	- - - - -	1.306	1.207		Bla+96[34]
291 Alice													
EAM	66°	+54°	247°	+55°					- - - - -	1.30	1.20		Kry+96
311 Claudia													
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
321 Florentina													
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	1.45	1.5		Synthesis
334 Chicago													
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	1.4		Synthesis
335 Roberta													
AM	80°	+15°	258°	+25°	78°	−25°	260°	−15°	- - - - -	2.09	1.14		Bla+00
337 Devosa													
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[31]		Tor+03
Synthesis	———		204°	+51°	———		195°	−62°	0.1938078	1.25	1.56		Synthesis
338 Budrosa													
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

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
349 Dembowska													
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[31]		Tor+03
Synthesis	153°	+34°	330°	+12°	—E—		—E—		0.1958836	1.31	1.17		Synthesis
352 Gisela													
AM			213°	+53°	33°	−53°			- - - - -	1.47	1.38		Bla+00
354 Eleonora													
EA			360°	+35°	—E—				- - - - -				Lup+81
A	132°	+45°	357°	+38°	177°	−38°	312°	−45°	- - - - -	1.36	1.0[1]		Zap+84
A	137°	+44°	363°	+28°	183°	−28°	317°	−44°	- - - - -	1.35	1.0[1]		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 [32]	———		356°	+20°	———		———		0.17821583	1.2	1.1[31]		Ka+02a
Synthesis	———		360°	+18°	—E—		—E—		0.1782159	1.2	1.1		Synthesis
356 Liguria													
R			Concentric ring region[6]						- - - - -				Ost87
360 Carlova													
EA	108°	+51°	337°	+47°	157°	−47°	288°	−51°	- - - - -	1.57	1.00		Dot+95
EAM[32]	105°	+47°	———		—E—		—E—		0.2578997	1.42	1.52		Mic+00
Synthesis	106°	+48°	———		—E—		—E—		0.2578997	1.45	1.26		Synthesis
372 Palma													
AM	44°	+78°	241°	+7°	61°	−7°	224°	−78°	- - - - -	1.202	1.066		Bla+98
L	———		———		68°	+2°	———		0.35796	1.1	1.3[31]		Tor+03
Synthesis	———		———		65°	−3°	———		0.35796	1.15	1.18		Synthesis
376 Geometria													
EAM	50°	+36°	230°	+38°					- - - - -	1.35	1.70		Kry+96
L	———		———		57°	−22°	240°	−35°	0.3219775	1.0	1.0		Mic+05
Synthesis	———		———		57°	−22°	240°	−35°	0.3219775	1.1	1.1		Synthesis
377 Campania													
AM	86°	+3°	266°	0°	86°	0°	266°	−3°	- - - - -	1.318	0.898		Bla+96[34]

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
382 Dodona													
EAM[32]	88°	+68°	———		———		———		0.17138450	1.54	1.33		Mic+04
L	83°	+64°	248°	+55°	———		———		0.17138442	1.4	1.3[31]		Mic+04
Synthesis	86°	+66°	———		———		———		0.171384	1.5	1.3		Synthesis
386 Siegena													
AM	56°	+14°					236°	−14°	- - - - -	1.116	0.776		Bla+98
389 Industria													
EAM	—E—		—E—		98°	−55°	314°	−50°	- - - - -	1.26	1.38		Mic93
AM			307°	+52°	127°	−52°			- - - - -	1.393	1.245		Bla+98
409 Aspasia													
AM	73°	+48°	216°	+35°	36°	−35°	253°	−48°	- - - - -	1.137	1.080		Bla+98
416 Vaticana													
EAM[32]	132°	+58°	310°	+22°	—E—		—E—		0.2238486	1.50[2]	1.19[2]		Mic+00
Synthesis	132°	+58°	310°	+22°	—E—		—E—		0.2238486	1.5	1.2		Synthesis
419 Aurelia													
AM			192°	+34°	13°	−34°			- - - - -	1.28	1.16		Bla+00
423 Diotima													
AM	170°	+63°	345°	+31°	165°	−31°	350°	−63°	- - - - -	1.14	1.50		Za+86b
EA	140°	+55°	———		—E—		—E—		0.1989448	1.16	1.05		Dot+95
Synthesis	155°	+59°	———		—E—		—E—		0.1989448	1.15	1.26		Synthesis
432 Pythia													
AM	121°	+65°					301°	−65°	- - - - -	1.37	1.27		Bla+00

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
433 Eros													
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[3]		—E—				0.2195937				Sto40
EA	−7°	+13°			—E—				0.21959390				Bey53
EA	10°	+46°			—E—				0.21959386	4.0	1.0[1]		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[8]			Dun76
A	moving[3]								- - - - -	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[5]						- - - - -				Mi+90b
E									0.219593957				Mag90b
C	19°	+14°	———		———		———		- - - - -	shape[10]			Th+00
L	16°	+9°	———		———		———		0.21959387	shape[31]			Ka+01
C[32,33]	17°	+11°	———		———		———		0.21959273	shape[10]			Mill+02
Synthesis	17°	+11°	—C—		—ESC—		—C—		0.219593	2.0	1.0		Synthesis
451 Patientia													
AM	153°	+67°	345°	+25°	165°	−25°	333°	−67°	- - - - -	1.07	1.0		Za+86b
EAM	150°	+45°	340°	+15°	———		———		0.4050651	1.04	1.2		Eri05
L	39°	+21°	163°	+25°	———		———		0.4058829	1.0	1.0[31]		Mic+05
Synthesis	39°	+21°	163°	+25°	———		———		0.4058829	1.0	1.0		Synthesis
471 Papagena													
AM	21°	+31°					201°	−31°	- - - - -	1.25	1.38		Bla+00
487 Venetia													
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
495 Eulalia													
Z			224°	+2°	44°	−2°			- - - - -				Bin87

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
505 Cava													
Z	113°	+4°					293°	−10°	- - - - -				You+85
EAM	138°	+40°	325°	+27°					- - - - -	1.22	1.20		Mic96a
511 Davida													
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[5]					- - - - -				Lag+95
L	———		303°	+44°	———		———		0.2137236	1.2	1.3[31]		Tor+03
Synthesis	—S—		300°	+34°	—ES—		—ES—		0.2137235	1.24	1.12		Synthesis
516 Amherstia													
EA	75°	+63°	256°	+55°	76°	−55°	255°	−63°	- - - - -	1.82	1.85		DeA95
EAM	76°	+30°							- - - - -	1.53	1.23		Mic96a
EAM[32]	75°	+17°					225°	−17°	0.3116333[2]	1.36	1.82		Mic+00
532 Herculina													
S							132°	−59°	- - - - -	1.21	1.01		Dr+85b
E					96°	−1°			0.3918711	1.0[1]	1.0[1]	X[19]	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[28]			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[31]		Ka+02a
Synthesis	———		287°	+17°	———		———		0.391872	1.2	1.2		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
534 Nassovia													
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
Synthesis	55°	+46°	241°	+49°	———		———		0.3945392	1.35	1.45		Synthesis
537 Pauly													
AM			290°	+40°	110°	−40°			- - - - -	1.25	1.88		Bla+00
554 Perago													
R			Concentric ring region[6]						- - - - -				Ost87
579 Sidonia													
Z	96°	+7°					276°	−7°	- - - - -				Bin87
584 Semiramis													
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[2]		DeA95
EAM	—E—		—E—		———		334°	−51°	0.2112061	1.25	1.12		Mic96a
L	———		———		106°	−39°	———		0.211205	1.3	1.2[31]		Tor+03
Synthesis	—E—		—E—		113°	−47°	335°	−50°	0.2112061	1.3	1.2		Synthesis
624 Hektor													
E	———		324°	+10°	—E—		—E—		0.28843884	shape[8]			Dun+69
A			313°	+11°	133°	−11°			- - - - -	2.00	2.63[11]		Pou81
A			315°	+10°	135°	−10°			- - - - -	2.02	1.0[1]		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[2]		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[2]		Det+92[25]
EAMD	145°	+3°					325°	−3°	- - - - -	1.0[1]	1.0[1]	X[15]	Det+92[25]
EAMD	149°	+22°					329°	−22°	- - - - -	shape[14]			Det+92[25]
EAMD	144°	+11°					324°	−11°	- - - - -	shape[14]			Det+92[25]
E	—E—		—E—		133°	−17°	336°	−33°	0.28835459				Det+92[25]
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

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
674 Rachele													
EAM	12°	+2°							1.2898610	1.93	1.09		Tun+02
675 Ludmilla													
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[31]		Tor+03
Synthesis	—E—		—E—		16°	−39°	210°	−52°	0.321551	1.3	1.2		Synthesis
683 Lanzia													
EA	198°	+55°	342°	+55°	162°	−55°	378°	−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	1.4	1.0		Synthesis
694 Ekard													
R			Concentric ring region[6]						- - - - -				Ost87
EAM	96°	+32°	———		—E—		—E—		0.246744	1.42	1.38		Dr+88b
EAM	105°	+29°	267°	+56°	—E—		—E—		0.2467465[2]	1.45	1.32[2]		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[2]		DeA95
L	———		———		89°	−48°	———		0.2467501	1.2	1.1[31]		Tor+03
Synthesis	98°	+40°	———		89°	−48°	———		0.2467501	1.3	1.2		Synthesis
704 Interamnia													
Z	70°	+10°					250°	−10°	- - - - -				Har+79
EAM	—E—		—E—		43°	−21°	224°	−22°	- - - - -	1.19[2]	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
Synthesis	51°	+22°	———		—E—		—E—		0.3636372	1.1	1.1		Synthesis
720 Bohlinia													
EAM[32]	65°	+40°	249°	+37°	———		———		0.3716084	1.4	1.2		Sli+03
L [32]	40°	+43°	230°	+41°	———		———		0.3716090	1.4	1.3		Sli+03
Synthesis	48°	+41°	236°	+38°	———		———		0.3716088	1.4	1.25		Synthesis
747 Winchester													
EAM	27°	+50°	———		—E—		—E—		- - - - -	1.16	2.60		Mic93
EA			353°	+39°	173°	−39°			- - - - -	1.18	1.00		DeA95
776 Berbericia													
EAM	7°	+20°	———		———		———		0.3194588	1.09	1.30		Eri00
EAM	8°	+23°	———		———		———		0.3194538	1.18	1.18		Tun+02
Synthesis	8°	+23°	———		———		———		0.319456	1.14	1.24		Synthesis
804 Hispania													
EAM	90°	+28°					270°	−28°	- - - - -	1.17	1.92		Mic92
EA	107°	+49°	227°	+50°	47°	−50°	287°	−49°	- - - - -	1.20	2.00		DeA95
852 Wladilena													
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

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
887 Alinda													
EAM			190°	+33°					3.0760710	1.06	1.56		Tun+02
951 Gaspra													
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[13],[12],[17]			Bar+92
C	19°	+21°	—C—		—C—		—C—		- - - - -				Da+94a
C	19°	+21°	—C—		—C—		—C—		- - - - -	shape[26]			Tho+94
E C									0.2934177				Sim+95
EA	19°	+20°	———		—E—		—E—		0.2934194	1.75	1.00		DeA95
L [32]	20°	+19°	———		———		———		0.2934191	shape[31]			Ka+01
EAM	20°	+26°							0.2934170	1.58	1.23		Tun+02
Synthesis	19°	+21°	—C—		—C—		—C—		0.293419	1.6	1.1		Synthesis
984 Gretia													
AM	46°	+47°	48°	+12°	228°	−12°	226°	−47°	- - - - -				Bla+00
1036 Ganymed													
E	Prograde rotation								0.42951				Lu+87b
E					Retrograde rotation								Hah+89
L	———		———		———		208°	−76°	0.42967	1.0	1.5[31]		Ka+02a
Synthesis	———		———		———		208°	−76°	0.42967	1.0	1.5		Synthesis
1219 Britta													
E					Retrograde rotation				0.232290				Bin+87
1223 Neckar													
EAM[32]	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°	———		———			1.5	1.3		Synthesis
1566 Icarus													
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
1572 Posnania													
EAM[32]	—E—		—E—		46°	−65°	———		0.3353931	1.35	1.04		Mic+01
Synthesis	———		———		46°	−65°	———		0.3353931	1.35	1.04		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
1580 Betulia													
A			140°	+20°			320°	−20°	- - - - -	1.21[10]			Ted+78
EAM	80°	+12°			212°	−5°			0.2565	1.7	1.4		Dru+90
L	136°	+22°	———		———		———		0.255765	1.1	1.4[31]		Ka+04
Synthesis	136°	+22°	———		———		———		0.255765	1.1	1.4		Synthesis
1620 Geographos													
E			—E—		20°	−60°			0.2176378	shape[8]			Dun74
A			check[5]						- - - - -				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—		56°	−47°	———		0.21763860	2.58	1.00		Mag+96
R	———		———		55°	−46°	———		0.21763863	2.5	1.0[29]		H+O99
L	———		———		55°	−45°	———		0.21763858	shape[31]			Ka+01
Synthesis	———		———		55°	−46°	———		0.21764	2.6	1.1		Synthesis
1627 Ivar													
E	Prograde rotation								0.19991				Lup+86
E	147°	+13°	333°	+18°					0.199953				Ve+89a[23]
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[31]		Ka+04
Synthesis	———		333°	+43°	———		———		0.1997987	1.9	1.3		Synthesis
1685 Toro													
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
1862 Apollo													
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
1980 Tezcatlipoca													
L	———		———		———		334°	−66°	0.302177	1.4	1.4[31]		Ka+04
Synthesis	———		———		———		334°	−66°	0.302177	1.4	1.4		Synthesis
2063 Bacchus													
R					24°	−26°			0.652	2.09	1.6[30]		Ben+99
Synthesis					24°	−26°			0.652	2.09	1.6		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0	β_0	λ_0	β_0	λ_0	β_0	λ_0	β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
2100 Ra-Shalom													
L	73°	+13°	———		———		———		0.824992	1.2	1.3[31]		Ka+04
Synthesis	73°	+13°	———		———		———		0.824992	1.2	1.3		Synthesis
2953Vysheslavia													
EAM	———		———		15°	−60°	190°	−65°	0.2622732	1.15	1.0		Vok+06
LEAM	———		———		8°	−68°	194°	−71°	0.2622713	shape[31]			Vok+06
Synthesis	———		———		11°	−64°	192°	−68°	0.2622722	1.15	1.0		Synthesis
3103 Eger													
E	Prograde rotation								0.2377819				Vel+92
L	———		———		10°	−50°	———		0.23778217	1.5	1[31]		Ka+02a
Synthesis	———		———		10°	−50°	———		0.23778217	1.5	1		Synthesis
3199 Nefertiti													
L	———		———		———		197°	−22°	0.12584029	1.1	1.1[31]		Ka+04
Synthesis	———		———		———		197°	−22°	0.12584029	1.1	1.1		Synthesis
3200 Phaeton													
EAM	—E—		—E—		97°	−11°	276°	−15°	0.1496080[2]				Kru+02
Synthesis	—E—		—E—		97°	−11°	276°	−15°	0.1496080				Synthesis
3908 Nyx													
EAM	177°	+23°	312°	+61°	—E—		—E—		0.18441	1.3	1.2[2]		Dru+90
R	43°	+71°			———		———			shape[30]			Ben+02
L	———		291°	+69°	———		———		0.1844208	1.2	1.0[31]		Ka+04
Synthesis	43°	+71°	291°	+69°	———		———		0.1844208	1.2	1.0		Synthesis
4179 Toutatis													
R	Precessing								- - - - -	2.10	1.35[29]		H+O95
4769 Castalia													
R							253°	−56°	0.17038	shape[30]			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	2.0	1.0		Synthesis
4957 Brucemurray													
L	———		———		———		358°	−50°	0.120510	1.1	1.1[31]		Ka+04
Synthesis	———		———		———		358°	−50°	0.120510	1.1	1.1		Synthesis

Basic data	Spin vector solutions (ecliptic coordinates of equinox 1950) λ_0 β_0	λ_0 β_0	λ_0 β_0	λ_0 β_0	Sidereal period (days)	Ellipsoidal model a/b	b/c	Albedo varieg.	Reference code
4979 Otawara									
EAM	———	———	50° −30°	———	0.112776	1.21	2.3		For+03
Synthesis	———	———	50° −30°	———	0.112776	1.2	2.3		Synthesis
5145 Pholus									
EAM	149° +26°			337° −5°	0.4159256	1.8	1.0		Far+01
5587 1990 SB									
L	———	———	———	253° −60°	0.210508	2.0	1.2[31]		Ka+04
Synthesis	———	———	———	253° −60°	0.210508	2.0	1.2		Synthesis
6053 1993 BW3									
E	—E—	—E—	175° −9°	359° −26°	0.107238[2]	1.08	1.5		Pra+97
L	178° +10°	———	———	358° −8°	0.107246	1.1	1.6[31]		Ka+02a
L	———	———	180° −6°	345° −14°	0.107238[2]	shape[31]			Dur02
Synthesis			178° −7°	354° −16°	0.10723	1.1	1.5		Synthesis
6489 Golevka									
EA[32]		345° +45°			0.25109	1.25			Mot+97
EA[32]		350° +25°			0.25111	1.6	0.7	X[35]	Mot+97
EA[32]				190° −55°	0.25123	1.25			Mot+97
EA[32]				200° −55°	0.25125	1.6	1.2	X[35]	Mot+97
R	———	———	———	202° −45°	0.251204	1.01	1.0[29],[30]		Hud+00
L	———	———	———	208° −47°	0.251238	shape[31]			Ka+01
Synthesis	———	———	———	205° −46°	0.25122	1.2	1.0		Synthesis
9969 Braille									
C	———	314° +65°	———	———	- - - - -	2.1	1.0		Ob+01
25143 Itokawa									
L	———	———	———	355° −84°	0.50550	2.0	1.3[31]		Ka+03
EA	———	———	39° −87°	———	0.50550	1.9	1.2		Ka+03
EA	———	———	———	320° −75°	- - - - -	2.13	1.68		Oh+03
Synthesis	———	———	39° −87°	355° −84°	0.50550	1.95	1.25		Synthesis

Footnotes:

[1] Assumed value.
[2] Mean value of two significantly different solutions.
[3] Different spin axis solutions for different apparitions was interpreted as indicating a precessing motion.
[4] Symmetric solution obtained, but quantitative specification is missing.
[5] Consistency check of previous spin vector determinations.
[6] Based on a radar experiment giving constraints on the aspect angle at the time of observation.
[7] Based on two radar experiments giving an aspect circle at the time of observation.
[8] Modelled as a cylinder with hemispherical ends.
[9] Modelled as a cylinder cut out of a sphere.
[10] Complex shape.
[11] Modelled as a Jocobi ellipsoid.

[12] Modelled as 8 octants of ellipsoids put together to form a continous surface.
[13] Modelled as an ellipsoid with a piece removed by a plane cut.
[14] Modelled as an irregular polyhedron.
[15] 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 are 17.238, 11.351
[34] Also presented in Bla+98.
[35] Model requires albedo variegation
[36] Suggested albedo variegations of 4%