

Lunisolar Resonances Revisited

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The lunisolar resonances may occur in the motion of Earth artificial satellites due to commensurabilities between the mean motion of the Sun or the Moon with the precession rate of a satellite's nodes and apsides, induced by the geopotential. The resonances were first indicated by Musen in 1960, but during the last 40 years the problem was treated only occasionally and in a quite selective manner. The present contribution reports recent studies by the author. The problem is simplified by imposing the Hill's approximation on the third body's perturbations. All apsidal and nodal-type resonances are identified and treated with a pendulum approximation. An example of a more refined analysis is given for one exemplary case. The resonances' overlapping zones are located and it is shown, that they may lead to a long-term chaotic evolution of satellites' orbits.