

ENCOUNTER IN THE KEPLERIAN FIELD: ANALYTICAL TREATMENT

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ABSTRACT

In extending the results of Henon and Petit (Celes.Mech., 38,67, 1986) an algorithm is suggested to construct the series representing the general encounter-type solution of the spatial eccentric Hill's problem. The series are arranged in powers of the eccentricity E of Hill's problem and two integration constants e and k characterizing eccentricity and inclination of the relative motion. A particular non-periodic solution of Henon and Petit corresponding to $E = e = k = 0$ is taken as an intermediary. The perturbations to this solution are constructed similar to the Lunar theory of Hill and Brown with the Universal Poissonian Processor. From theoretical point of view Hill's problem for the encounter case is of particular interest. In distinction from the Lunar problem we do not have here angular arguments with different frequencies. Moreover, the perturbations related with the external eccentricity E (analogous to the perturbations in the motion of the motion of the Moon caused by the eccentricity of the orbit of the Sun) are of resonance character.