Coorbital quasi-periodic orbits in the three-body problem

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Within the framework of the planar three-body problem we establish the existence of quasi-periodic motions and KAM 3-tori related to the coorbital motion of two small moons about a large planet where the moons move in nearly circular orbits with almost equal radii. The approach is based on a combination of normal form and symplectic reduction theories and the application of a KAM theorem for high-order degenerate systems. To accomplish our results [2] we need to expand the Hamiltonian of the three–problem as a perturbation of two uncoupled Kepler problems. This approximation is valid in the region of phase space where coorbital solutions occur, see reference [1].

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References