

A Semi-Analytical Model for Proper Elements of the Trojan Asteroids

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In this communication we present a method for the estimation of proper elements for asteroids located in tadpole orbits around the equilateral Lagrange points of the Sun-Jupiter system. The method employed is based on an asymmetric expansion of the Hamiltonian (in canonical variables) for the restricted three-body problem, in the vicinity of the 1:1 mean-motion resonance. As additional perturbations, we included the secular variations of Jupiter's orbit, as well as direct perturbations from the remaining exterior planets. A solution of the resulting system is then obtained by means of the so-called Henrard's Method (Henrard, 1990, *Cel. Mech. & Dynam. Astr.*, **49**, 43-67).

As results we present values of the proper elements (in the space of canonical momenta as well as in orbital elements a, e, i) for a set of real Trojan asteroids. These are then compared with the values obtained by Milani (1994, *Cel. Mech. & Dynam. Astr.*, **57**, 59-94).