

Transport Dynamics: From the Bicircular to the Real Solar System Problem

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1 Introduction

The main goal is to give an explanation of transport in the Solar System based in dynamical systems theory. More concretely, we consider as an approximation of the Solar System, a chain of independent Bicircular problems in order to get a first insight of transport in this simplified case. Each bicircular problem (BP) consists of the Sun (S), Jupiter (J), a planet and an infinitesimal mass. For each fixed BP we consider *natural* periodic orbits which are unstable. These periodic orbits are the dynamical substitutes in the BP of the collinear equilibrium points L_1 and L_2 of the Circular Restricted Three Body Problem (CRTBP) Sun-Planet-particle. We study the behavior of their invariant manifolds, in order to look for *connections* between invariant manifolds of consecutive BP.

We are interested in transport from the external Solar System to the internal one. On one hand we start with the BP S-J-Neptune-particle and the dynamical substitute of L_1 of the CRTBP S-Neptune-particle, and its unstable invariant manifold. On the other hand we consider the BP S-J-Uranus-particle, and the dynamical substitute of

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