

Manifolds connections and the transport of small bodies through mean motion resonances in the Solar System

We discuss how the transport of small bodies through the orbit of Jupiter in the Solar System is governed by the heteroclinic intersections between the stable and unstable manifolds of the unstable periodic orbits corresponding to each one of the main mean motion resonances between the body's and Jupiter's orbits. These manifolds have been extensively discussed in literature in the case of the co-orbital resonance. (manifolds of the periodic orbits around the collinear Lagrangian points), but to a lesser extent for other important mean motion resonances. Here we show how a global visualization of these manifolds can be achieved through the computation of short time Fast Lyapunov Indicator maps, allowing to depict their underlying intricate heteroclinic dynamics. A precise computation of these manifolds with direct semi-analytical methods is in progress.

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