INVARIANT MANIFOLDS, THE SPATIAL THREE-BODY PROBLEM AND SPACE MISSION DESIGN

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The invariant manifold structures of the collinear libration points for the spatial restricted three-body problem provide the framework for understanding complex dynamical phenomena from a geometric point of view. In particular, the stable and unstable invariant manifold "tubes" associated to libration point orbits are the phase space structures that provide a conduit for orbits between primary bodies for separate three-body systems.These invariant manifold tubes can be used to construct new spacecraft trajectories, such as a "Petit Grand Tour" of the moons of Jupiter. Previous work focused on the planar circular restricted three-body problem. The current work extends the results to the spatial case.