

Low Energy Interplanetary Transfers Using Invariant Manifolds of L1, L2 and Halo Orbits

Lo, M.W., S.D. Ross

The invariant manifolds associated with the outer planets are extremely large objects in phase space. They are trajectories in the ecliptic which intersect one another. This enables a low energy single impulse transfer between the planets which requires several orbital periods. However, if we consider the Jovian satellites where the same dynamics occur but with much shorter orbital periods, this approach may be used for new tour designs requiring minimal ΔV . The existence of this transfer is an indication of the instability of the region of space between the satellites. It may explain some of the difficulties encountered in traditional satellite tour designs using conic approximations.