

LOWENERGY TRANSFER TO THE MOON

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In 1991, the Japanese Hiten mission used a low energy transfer with a ballistic capture at the Moon which required less ΔV than a standard Hohmann transfer. In this paper, we apply the dynamical systems techniques developed in our earlier work to reproduce systematically a Hiten-like mission. We approximate the Sun–Earth–Moon-spacecraft 4-body system as two 3-body systems. Using the invariant manifold structures of the Lagrange points of the 3-body systems, we are able to construct low energy transfer trajectories from the Earth which execute ballistic capture at the Moon. The techniques used in the design and construction of this trajectory may be applied in many situations.