Dynamical Systems, the Three-Body Problem and Space Mission Design
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This paper concerns heteroclinic connections and resonance transitions in the planar circular restricted 3-body problem, with applications to the dynamics of comets and asteroids and the design of space missions such as the Genesis Discovery Mission and low energy Earth to Moon transfers. The existence of a heteroclinic connection between pairs of equal energy periodic orbits around two of the libration points is shown numerically. This is applied to resonance transition and the construction of orbits with prescribed itineraries. Invariant manifold structures are relevant for transport between the interior and exterior Hill's regions, and other resonant phenomena throughout the solar system.