

ASTRODYNAMICS SYMPOSIUM (C1)
Orbital Dynamics - Part 2 (4)

Author: Dr. Francisco Salazar
National Institute for Space Research - INPE , Brazil, e7940@hotmail.com

Prof. Elbert E.N. Macau
Instituto Nacional de Pesquisas Espaciais (INPE), Brazil, elbert@lac.inpe.br
Prof. Othon Winter
UNESP - Univ Estadual Paulista, Brazil, ocwinter@pq.cnpq.br

OPTIMAL LOW-COST TRANSFER TO L4 AND L5 LAGRANGIAN POINTS

Abstract

Lagrangian points L4 and L5 lie at 60 degrees ahead of and behind Moon in its orbit in related to the Earth. Each one of them is a third point of an equilateral triangle with the base of the line defined by those two bodies. These Lagrangian points are stable in related to perturbations. Because of their distance electromagnetic radiations from the Earth arrive on them substantially attenuated. As so, these Lagrangian points represent remarkable positions to host astronomical observatories. However, this same distance characteristic may be a challenge for periodic servicing mission. In this work, we introduce a new low-thrust orbital transfer strategy that opportunisticly combine chaotic and swing-by transfers to get a very efficient strategy that can be used for servicing mission on astronomical mission placed on Lagrangian points L4 or L5. This strategy is not only efficient in related to thrust requirement, but also its time transfer is comparable to others known transfer techniques based on time optimization.