Lunar Exploration (2)
Lunar Exploration (5) (5)

Author: Dr. Lei LIU
Beijing Aerospace Control Center (BACC), China, llbacc@139.com

Dr. Hua Zhai
China, gyx262020@163.com
Mr. Chen Gao
Northwestern Polytechnical University;National Key Laboratory of Aerospace Flight Dynamics, China, gaochen@mail.nwpu.edu.cn

OPTIMIZATION OF TRANSFER TRAJECTORY TO LUNAR L2 LIBRATION POINT VIA A LUNAR SWING-BY

Abstract

Aiming at the application of the lunar collinear libration point, this paper compares and analyzes the types of transfer orbits to the lunar L2 point in the existing research work, and studies optimization of the transfer orbit to the lunar L2 point via a lunar swing-by. Firstly, the transfer trajectory to the lunar L2 point via a lunar swing-by is designed. Based the designed trajectory, the control energy for trajectory correction and injection to the target L2 orbit is optimized during the flight course from the lunar swing-by to the target L2 orbit. For the optimization, the conditions for computation are, respectively, limiting the state of lunar swing-by and injection to the target L2 orbit, tuning the control strategy of trajectory correction, and loosening the state of lunar swing-by. The research can provide a useful reference for the application of the lunar libration points in the moon and deep space exploration missions in the future.