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PHASING CONTROL OF RELAY SATELLITE AROUND EARTH-MOON LIBRATION POINT

Abstract

China's Que-qiao relay satellite has realized the practical application of the Earth-Moon libration point for the first time, and played an indispensable role in the first human soft landing mission on the back of the moon, Chang'e-4 mission. In the application of the Earth Moon libration point orbit, one of the key issues to be considered is the influence of shadow of the Earth and Moon, which may lead to the failure of the energy system of the detector, resulting in mission failure. Another issue to be considered is mission re-planning, such as re-planning the libration point relay satellite to cover other specific positions on the lunar surface. These two problems are both related to the phase adjustment and control of the libration point relay satellite. For this reason, we study the phase adjustment of relay satellite in the halo orbit around the Earth-Moon libration point, which includes two ways: transfer adjustment within the libration point region and by large-scale orbit transfer. The transfer time, energy consumption, advantages, and disadvantages of the two ways are compared, which provides a reference for the current and subsequent application of the Earth-Moon libration point.