SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 2 (2B)

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CHANG'E-2 SATELLITE LAGRANGE L2 POINT MISSION

Abstract

Chang'e-2 satellite is the second lunar prober of China. It was launched on Oct 1st 2010. It successfully finished the predfined mission on April 1st 2011. In the extend mission phase, On June 9th 2011, Chang'e-2 satellite escaped from the lunar orbit,and transferred to the Sun-Earth lagrange L2 point. After nearly 3 months journey, the prober successfully inserted into the L2 point Lissajous orbit on August 25th 2011. Chang'e-2 satellite was the first Lagrange L2 point mission of China. And it was also the first prober in the world, which escaped from the lunar orbit and transferred to the Lagrange L2 point. In this paper, the design and implement of Chang'e-2 satellite Lagrange L2 point mission is introduced. Firstly, lunar mission of the Chang'e-2 satellite is introduced briefly. and the prober's subsystem and state in the extend mission phase are also introduced. Secondly, the targets of the extend mission are discussed, the background of the mission and the alternative plans are also involved. Thirdly, two kinds of libration point orbits(halo orbit and lissajous orbit) are discussed. what's more, the mission analysis and design are introduced, including how to desinging libration transfer orbit when considering the prober circling in the lunar orbit, cruise attitude, space environment, thermal contol, communication link budget, ΔV budget and so on. Fourthly, the lagrange L2 point mission procedure is introduced. The Chang'e-2 satellite escaped from the lunar orbit after two maneuvers. In the cruise phase, only two mid-course maneuvers were executed; the other 3 planed maneuvers were canceled for accurately orbit determination and orbit control. finally, the current state and the future mission of Chang'e-2 satellite are discussed.