

Lunar Exploration (3)

Lunar Concepts (3)

Author: Mr. ZHANG Wangjun

Beijing Institute of Spacecraft System Engineering, China Academy of Space Technology (CAST), China,
zhaa4561@sina.com

STUDY ON A KIND OF RECONFIGURABLE AND RESUABLE LUNAR PROBE

Abstract

In order to achieve soft-landing on the lunar surface, the structure and mechanism products which can't be used again after landing contribute a large proportion in current lunar lander, so it is necessary to improve the utilization of these products. Constrained by system resources, a single lunar rover's exploration range and capacity are limited, and if it is not working in lunar surface, the mission will fail. Moreover, because of the long span among various lunar missions, new designed lunar probes led to a long cycle and high cost, so it is necessary to strengthen the universal application. In order to solve the above problems, this paper presents a reconfigurable and reusable landing-rover, which can be divided into four independent rovers and core connecting unit by setting up the normalized interface of separation. After landing, the lunar probe would be separated into four rovers that work independently or form different configurations together to accomplish complicated tasks. Each rover uses unified platform which reduces the development cycle and cost. According to the requirements of the payload, targeted designing is carried out on the rover in order to improve the proportion of the payload. The tanks and cylinders of the lunar probe can be reused for storing resources which were produced on the moon, and it would be ready for a future moon base or a launch pad on the moon.