

Lunar Exploration (3)

Lunar Concepts (3)

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RESEARCH ON THE CONCEPT OF REUSABLE AND LIGHTWEIGHT MANNED LUNAR LANDER FOR CREW TRANSPORTATION

Abstract

Apollo project, a great manned lunar exploration mission, supported two astronauts on the lunar surface for three days. But it did not undertake lunar developing and utilization plan. After only 6 short manned lunar landing tasks, they stopped. In recent years, manned lunar exploration for the developing and utilization of the long-term survival by lunar space mission of the future mankind develops, with the deepening of human lunar research and unmanned exploration activities, as well as the continuously development of space technology. The mission must support crew in the lunar long-term survival by lunar cabin. Therefore, former mission such as Apollo project short-term manned lunar landing mission, especially with crew transportation and lunar surface of the large-scale residential lunar landing at the same time is not adapted to the future long-term scientific research and resource utilization task. This paper presents a new concept of the lunar surface lander, which can achieve lunar orbit to the moon surface cabin crew of the round-trip transportation, because there is no need to support t lunar surface task. It greatly reduces the size of the lunar lander, thereby reduces the entire spacecraft system size and launch vehicle capacity requirements, and could support large-scale, low-cost round trip lunar research and development tasks. In this paper, we first analyze the typical manned lunar program in the world at first, then propose a variety of flight modes from the earth to the moon for future lunar developing and utilization. After that, we propose manned flight mode for the preferred flight mode. Novel lunar lander concept is raised, with the use of pressure sealed cabin, life support system and landing on the integrated design, lightweight, reusable and other means. Finally, the whole crew transportation system is analyzed and compared with other manned lunar landing program.