SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Space Transportation Solutions for Deep Space Missions (8-A5.4)

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A NOVEL VEHICLE CONCEPT USED FOR MULTI-TASK DEEP-SPACE EXPLORATION

Abstract

Generally, the deep-space exploration projects are huge, long term and costive. In order to increase the exploration efficiency and reduce the costs, multi-task exploration is usually employed, that is, to fulfill multiple tasks in a single launch. In this paper, a novel vehicle concept used for multi-task deep-space exploration is proposed. This method is based on the design of standard modules, including a propulsion module and several standard deliver modules. In this way, according to different deep-space exploration missions, the vehicle can carry different loads to achieve orbit transfer, preset orbit entering and accurate positioning load delivering. This paper introduces the general design of deep-space exploration tasks with the use of this kind of vehicle, states the concept of this novel vehicle, and particularly gives the comprehensive design of the vehicle employed in lunar exploration, including its components and exploration method. This paper can be used as the reference for future deep-space exploration task design and vehicle design.