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TECHNICAL STUDY ON THE STRUCTURAL DESIGN OF KOREAN LUNAR EXPLORER

Abstract

This paper shows the technical study on the structural design of the first Korean lunar explorers. The lander and orbiter are planned to be launched in early 2020 according to the national space development strategy. The basic premise of the design is that the each of the bus platform of lander and orbiter is to be same due to managerial reasons such as schedule and cost. However, at this point of time, it is a top priority to secure the technical capability because of less experience about the lunar explorer. For this reason, subsystem engineers investigate the core technology and perform a series of trade studies to find out design to be compliant with the subsystem requirement based upon the system level requirement from mission. The general role of structure subsystem is to safely support the spacecraft under the launch load, on-orbit condition, ground handling and landing impact and to serve the accommodation space for several equipments. In case of lunar explorer, constructing lightweight structure is the most important technology. It is achieved by means of selecting light material such as composite and optimizing the shape of parts and efficient load path. In special, lunar lander should be stable during landing without tip-over. In this paper, the current status of Korean lunar explorer development and trade studies of structural design and analysis including tip over analysis are described.