

A Study on Dynamic Modeling Considering Fuel Sloshing for Korean Lunar Module

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Summary

The aim of this paper is to discuss the main issues related to modeling and simulation of the Korean lunar module. Lunar module usually consists of a rigid platform, attitude control actuators and a fuel tank. For dynamical modeling, we first assumed the lunar module as a rigid body and derived equations of motion by considering allocation of reaction thrusters and reaction wheel assembly(RWA). Fuel sloshing in lunar module and its influence on attitude dynamics are an important issue in the research field of space technology. In order to include the effect of fuel sloshing on the dynamics, we model it as a spherical pendulum for a simple analysis. Finally, we construct a dynamical model by combining all these elements and perform a simulation based on the equations of motion.

