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A NEWLY ANDROGYNOUS DESIGN OF SOFT DOCKING MECHANISM FOR MICRO/SMALL
SATELLITES

Abstract

The soft docking of micro/small satellites has already attracted much attention worldwide. In this investigation, a newly androgynous design of soft docking mechanism for micro/small satellites is proposed. The structure deformation is designed to take an effect on the soft docking, which is capable of buffering the docking impact shock. The soft docking mechanism has a much simpler structure as well as a larger scope of bearing the deviation of relative position and attitude between the chaser satellite and the target satellite than traditional docking mechanism. Moreover, the newly designed mechanism provides multi-interface for on orbit service. According to such a novel design, the soft docking process is modeled and its main influence factors are analyzed. The docking impact as well as its influence on the attitude of the paired-satellite is discussed. The ground experiment is developed to study and validate the performance of the soft docking mechanism.