MATERIALS AND STRUCTURES SYMPOSIUM (C2)
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THERMAL MATERIAL EXPOSED EXPERIMENT BASED ON RVD IN LEO

Abstract

During the flight in the Low Earth Oribit,thermal control materials on the surface of Manned spacecraft will directly expose to the space environment.The effects of charged particles,UV radiation,oxgen atoms,and high vacuum may change the physicochemical characteristics of thermal control materials,which may change the service life of Manned spacecraft,or even leads to an unexpected ending of flight mission.

In order to achieve the change law of the thermal control materials on Manned spacecraft surface,an exposed experiment is needed.A programme of exposed experiment in LEO based on the RVD(Rendezvous and Docking)mission can be designed and executed.This programme can obtain some samples of thermal control materials with out an high risk EVA.

The hatch of the target spacecraft will be exposed to the space environment for a long time during the independent flight mission,while with the process of Rendezvous and Docking finished,operation for exterior surface of the hatch can be done with out EVA,and someting can be transferred from the target spacecraft to the manned spacecraft,Utilizing this advantage,an exposed testing components on the hatch can be designed utilized to obtain the data of thermal control materials affected by space environment and can be recovered after RVD for further analysis.