MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Interactive Presentations (IP)

Author: Ms. ZhengAi Cheng
Qian Xuesen Laboratory of Space Technology, China

Dr. Yufei Liu
Qian Xuesen Laboratory of Space Technology, China
Ms. xiaoqi Huang
China Aerospace Science and Technology Corporation (CASC), China
Dr. Xinghua Zhang
Qian Xuesen Laboratory of Space Technology, China

FOLD-DEPLOYMENT CONCEPT AND PROTOTYPE DESIGN FOR AIR-INFLATABLE SOLAR SAIL

Abstract

Solar sail is becoming a research highlight because it use light pressure as propulsion without any fuel. The folding and deploying technology, compact structure design, control mechanism and mechanical property are key technologies in 100-meter class solar sail. Special air-inflatable booms and L-shape sail folding method was designed. Aiming at this fold-deployment concept we customized the compact structure. To test and verified the technologies, an 88m principle prototype was developed. After manufacturing and assembling the prototype, a simple deploying test is done to verify the whole configuration. The result shows the prototype works good and the whole design can insure the sail deploy smoothy leading by the inflatable booms. The fold-deployment concept and support-package structure are verified to be feasible and valid. The prototype laid an important foundation of followed up mechanical and dynamic experiments.