

MATERIALS AND STRUCTURES SYMPOSIUM (C2)

Space Structures II - Development and Verification (Deployable and Dimensionally Stable Structures) (2)

Author: Mr. Takaomi Chubachi
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Tokyo Institute of Technology, JapanDECREMENT PROPERTIES OF DEPLOYMENT TORQUE FOR SELF-DEPLOYABLE TUBULAR
CFRP BOOMS UNDER STORED STATE**Abstract**

This paper presents the effects of long term loading under the stored environment on decrement properties of deployment torque for the self-deployable tubular CFRP booms as well as the hybrid self-deployable tubular CFRP booms experimentally. The self-deployable tubular CFRP booms have attractive feature to deploy light weight deployable space structures, and by improve the deployment torque we have developed the hybrid self-deployable tubular CFRP boom by installing a metal convex tape in the conventional self-deployable tubular CFRP boom so as to keep the foldability with higher deployment torque and to reduce the decrement rate of deployment torque due to a long term stored state. One of the significant technical issues is the torque decrement of the self-deployable CFRP boom under stored condition before deployment, because it takes several weeks through several years until which depends on the mission of the deployable structures. We investigate the torque decrement properties of the hybrid self-deployable tubular CFRP boom experimentally. Experimental results show the detailed decrement torque properties of deployment torque quantitatively for the self-deployable tubular CFRP boom and hybrid one.