MATERIALS AND STRUCTURES SYMPOSIUM (C2)
New Materials and Structural Concepts (4)

Author: Prof. Hiroshi Furuya
Tokyo Institute of Technology, Japan, furuya@enveng.titech.ac.jp

Mr. Jin Yokoyama
Tokyo Institute of Technology, Japan, yokoyama@space.enveng.titech.ac.jp

CONCEPT AND MECHANICAL PROPERTIES OF BELLOWS-TYPE INFLATABLE-TUBES

Abstract

The concept of the bellows-type inflatable tubes is proposed and the mechanical properties of the inflatable-tubes subject to bending load are investigated by the FEM analyses. By the FEM analysis, the wrinkles in the circumferential direction emerges on the tension side. Also, the bending stiffness is determined by the ratio of the radius of curvature in longitudinal direction to that in circumferential direction, the collapse moment is principally affected by the internal pressure. Moreover, the bending stiffness by the FEM analysis is expressed by the theoretical analysis using the membrane theory.