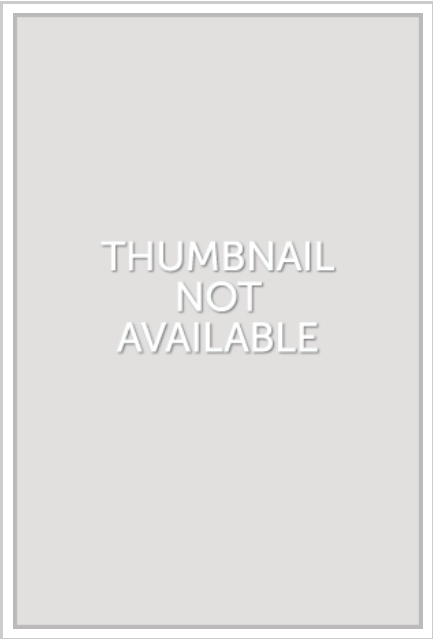


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Experimental Vibration Analysis of Inflatable Beams for an AFIT Space Shuttle Experiment

By Thomas G. Single

Bibliioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x11 mm. This item is printed on demand - Print on Demand Neuware - The Department of Defense, NASA, and others are considering space-based inflatable structures to reduce the costs associated with the design, manufacturing, and launch of space structures. The Rigidized Inflatable Get-Away-Special Experiment (RIGEX) is an autonomous, self-contained Space Shuttle experiment that will inflate and rigidize several cylindrical beam structures. After inflation and rigidization, the experiment will perform a vibration analysis by exciting the rigidized beams with piezoelectric transducers (PZTs) and collecting the acceleration at the tip of the beam via a tri-axial accelerometer in the zero-g vacuum of space. This thesis presents the experimental vibration analysis for the beams on the ground, using a shaker for excitation to characterize the modal properties. Piezoelectric transducers are then used for excitation in modal tests in a near-vacuum. The test data for the bending modes are compared to an Euler-Bernoulli beam theory model to determine its validity for analytic prediction. 182 pp. Englisch.

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