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

Author: Mr. Cristovao Cardoso
Hps-high Performance Structures, Lda, Portugal

Mr. Pedro Teixeira
Hps-high Performance Structures, Lda, Portugal
Mr. Joao Pedro Loureiro
Hps-high Performance Structures, Lda, Portugal
Mr. Ivo Costa
Hps-high Performance Structures, Lda, Portugal
Mr. Luis Moreira
INEGI, Portugal
Mr. Jhonny Rodrigues
INEGI, Portugal
Mr. Clifford Ashcroft
The Netherlands
Mr. Ludovic Puig
ESA, The Netherlands

TEST AND ANALYTIC MODEL RESULTS CORRELATION FOR DEPLOYABLE TRUSSWORK MAST

Abstract

Under the ESA activity for Large Stable Deployable Structures for Future Science Missions (LADS), HPS is developing a deployable mast for X-Ray telescope, 12m long, 4m wide, to hold the 1ton instrument, to reach TRL 5 (deployment mechanism not included).

An analytic model was developed to calculate the mast: deployment error, friction error, thermal expansion deformation, moisture absorption deformation, bending stiffness, shear stiffness, torsion stiffness, limit loads, mass, etc.

Material and elementary tests are now being finalized. The results from these tests will be used as inputs in the analytic model.

A 2m long breadboard, composed of 2 bays was built and will be tested during March and April. These tests will measure: deployment error, friction error, bending + shear stiffness, torsion stiffness, mast mass and mast damping.

This paper will present and correlate the predictions made with the analytic model and the measurements made on the 2 bays breadboard.