

## MATERIALS AND STRUCTURES SYMPOSIUM (C2)

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

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## MESH DEPLOYABLE ANTENNA MECHANICS TESTING METHOD

**Abstract**

Rapid development in spatial technologies and continuous expansion of astronautics applications require stricter and stricter standards in spatial structure. Deployable space structure as a newly invented structural form is being extensively adopted because of its characteristic (i.e. deployability). Deployable mesh reflector antenna is a kind of common deployable antennas. Its reflector consists in a kind of metal mesh. Its electrical properties are highly dependent on its mechanics parameters (including surface accuracy, angle, and position). Therefore, these mechanics parameters have to be calibrated. This paper presents a mesh antenna mechanics testing method that employs both an electronic theodolite and a laser tracker. The laser tracker is firstly used to measure the shape of radial rib deployable antenna. The measurement data are then fitted to a paraboloid by means of error compensation. Accordingly, the focus and the focal axis of the paraboloid are obtained. The following step is to synchronize the coordinate systems of the electronic theodolite and the measured antenna. Finally, in a microwave anechoic chamber environment, the electromechanical axis is calibrated. Testing results verify the effectiveness of the presented method.