

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
Smart Materials and Adaptive Structures (5)

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DAMAGE DETECTION TECHNIQUE OF SOLAR SAIL MEMBRANE

**Abstract**

This paper introduces a technique to identify the structural properties of very large membrane structures and to detect the damages on the membrane for solar sail. The technique is based on the changing the structural vibration and the vibration modes due to the damages on the membrane with wavelet transformation techniques. The vibration information is obtained by the time series of two-dimensional image data, and is transformed into wavelet. Evaluating the differences between the initial and the damaged wavelet information, the damages can be detected. A simple numerical example of square membrane model is performed to investigate the performance of the proposed damage detection technique.