

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

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ACTUATORS LOCATION OPTIMIZATION AND ACTIVE VIBRATION CONTROL OF LARGE  
FLEXIBLE SPACE STRUCTURES

**Abstract**

This study made research on active vibration control of the large flexible structures. An active vibration control scheme was designed. The locations of the actuators were optimized using genetic algorithm and quadratic program, which take the weighted presentation of the control voltage, number of actuators as the objective function. The dynamic equations of the actuator and structure were yielded utilizing FEM method. A FEM analysis was carried out using the software Patran/Nastran to predict the static and dynamic behavior of the antenna. LQG controller was yielded based on the dynamic parameters of the structure which were extracted using the Matlab program. Dynamic response analysis of the structure subject to external disturbance was performed utilizing the numerical model which was designed in Matlab/simulink. The simulated results showed that more than 90% of the vibration at resonating frequency was suppressed compared with the uncontrolled status.