

Nonlinear Adaptive Control for Slewing Flexible Active Structures

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Abstract

The development of lightweight flexible structures that include both advanced control and active material will impact several space application areas. One way to reduce vibration is the combination of advanced control methods such as nonlinear adaptive control plus active structure technology. Active structures with both sensors and actuators, strategically placed along the structure, can suppress vibrations and enhance slewing performance. Active vibration suppression is accomplished with a graphite/epoxy composite structure that includes embedded strain sensors and actuators.

Keywords: Graphite-epoxy composites, Flexible spacecraft, Vibration damping, Embedded Sensors, Adaptive control, Actuators, Strain gages, Non-linear Control, Low weight, Flexible structures, Active control, Space applications, Slewing