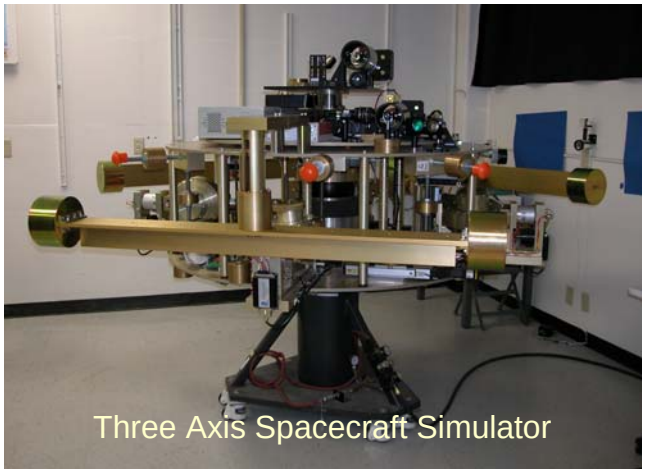
On-orbit System Identification and Slew Maneuver Control of Flexible Spacecraft

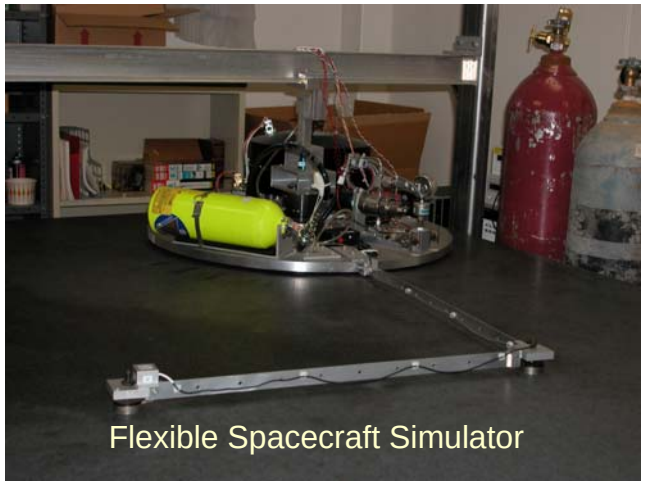
Project Objective: For spacecraft applications where rapid slew maneuvers for acquisition of target points are required, effects of structural flexibility significantly degrade the pointing performance. The objective of this research is to develop and evaluate different techniques for slew maneuver control of flexible spacecraft to minimize slew time, settling time and pointing error.

Research/Thesis Topics:

- Development of slew maneuver control profile with Control Moment Gyroscopes (CMGs)
- On-orbit system identification of system frequencies and inertia for adaptive slew control
- Input shaping and notch filter design for slew maneuvers
- Flexible spacecraft hardware development and experiment

Experimental Test Beds:


Three Axis Spacecraft Simulator


Flexible Spacecraft Simulator