



Technology Maturation of a Dual-Spinning CubeSat

Problem Statement

- This experiment addresses the need for more capable and enabling earth sensor platforms on a nano-satellite scale.
- Requested microgravity flight allows us to test and characterize a unique scanner assembly and integrated attitude control system in a relevant environment
- Potential users: CubeSat community, earth observation scientists

Technology Development Team

- MIT Space Systems Laboratory MicroMAS team
- PI: Prof. Kerri Cahoy (kcahoy@mit.edu)

Proposed Flight Experiment

Experiment Readiness:

- The experiment will be ready for flight in the first quarter of 2013.

Test Vehicle:

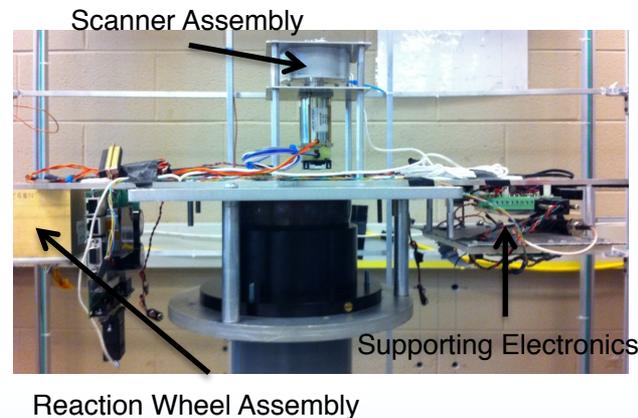
- Parabolic aircraft

Test Environment:

- The unit has not previously flown, and we request a zero-g environment.

Test Apparatus Description:

- Prototype of CubeSat-sized bus, scanner assembly, and payload
- Payload rotation driven by motor controllers
- Payload rotation measured with encoder



Technology Maturation

- TRL 4 - Current
- TRL 5 – First Quarter 2013
- TRL 6 – Second Quarter 2013
 - Relevant environmental testing of prototype (microgravity flight)
 - Deadline: July 2013
- Other Planned Testing
 - Thermal-vacuum
 - Vibration
 - Lifetime

Objective of Proposed Experiment

- Characterize scanner assembly rotation in microgravity
- Verify control authority of reaction wheel assembly
- Monitor power consumption of relevant components
- Expected flight data: payload rotation rates, voltage and current draw, telemetry from ADCS sensors and actuators, video.