GEC

Attitude Control System

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Assessment

- Requirements can be met for all considered scenarios:
  - Elimination of Fabry-Perot Interferometer
  - Elimination of UV Imager
  - 1.1m x 2.0m spacecraft
  - Elliptical spacecraft
  - 0.85 x 2.6m spacecraft
- Review component & design recommendations
- Review ACS mode recommendations

Requirements/Assumptions

- Attitude Control: ±5 Degrees
- Knowledge: ±0.01 Degrees

- 200x2000 Parking Orbit
- 130x2000 Dipping Orbit
- 6.669E-09 Kg-m^{-3}
- 78 Degree Inclination
- 2cm CPCG Offset

Component Recommendations

Design Recommendations

- A pitch momentum-biased system with the wheel(s) sized to insure that the effect of aerodynamic torques does not cause any pointing violations.
  - Single wheel with spin axis along pitch axis
    - Will need approximately 100 Nms momentum capability for the 1.1x2m configuration and 80 Nms for the .85x2.6m configuration
  - Two wheels with spin axis canted 30 degrees from the pitch axis in the pitch-yaw plane
    - Will need approximately 56 Nms momentum capability per wheel for the 1.1x2m configuration and 45 Nms for the .85x2.6m configuration

ACS Mode Recommendations

- **Acquisition:** Acquire sun on the solar arrays & Null rates
- **Science:** Track velocity vector & Maintain zenith pointing
- **Delta-V:** Orbit adjust
- **Delta-H:** Momentum unloading
- **Slew:** 180° flip for retro burn
- **Safe Hold:** Independent safe mode

Bottom Line!

- ACS is basically stable
- A last minute note: With the perigee of the parking orbit changing from 350 to 200 Km, IPACS power has changed from 20W to approximately 54W