

FUSE Mission Planning with the New Attitude Control System

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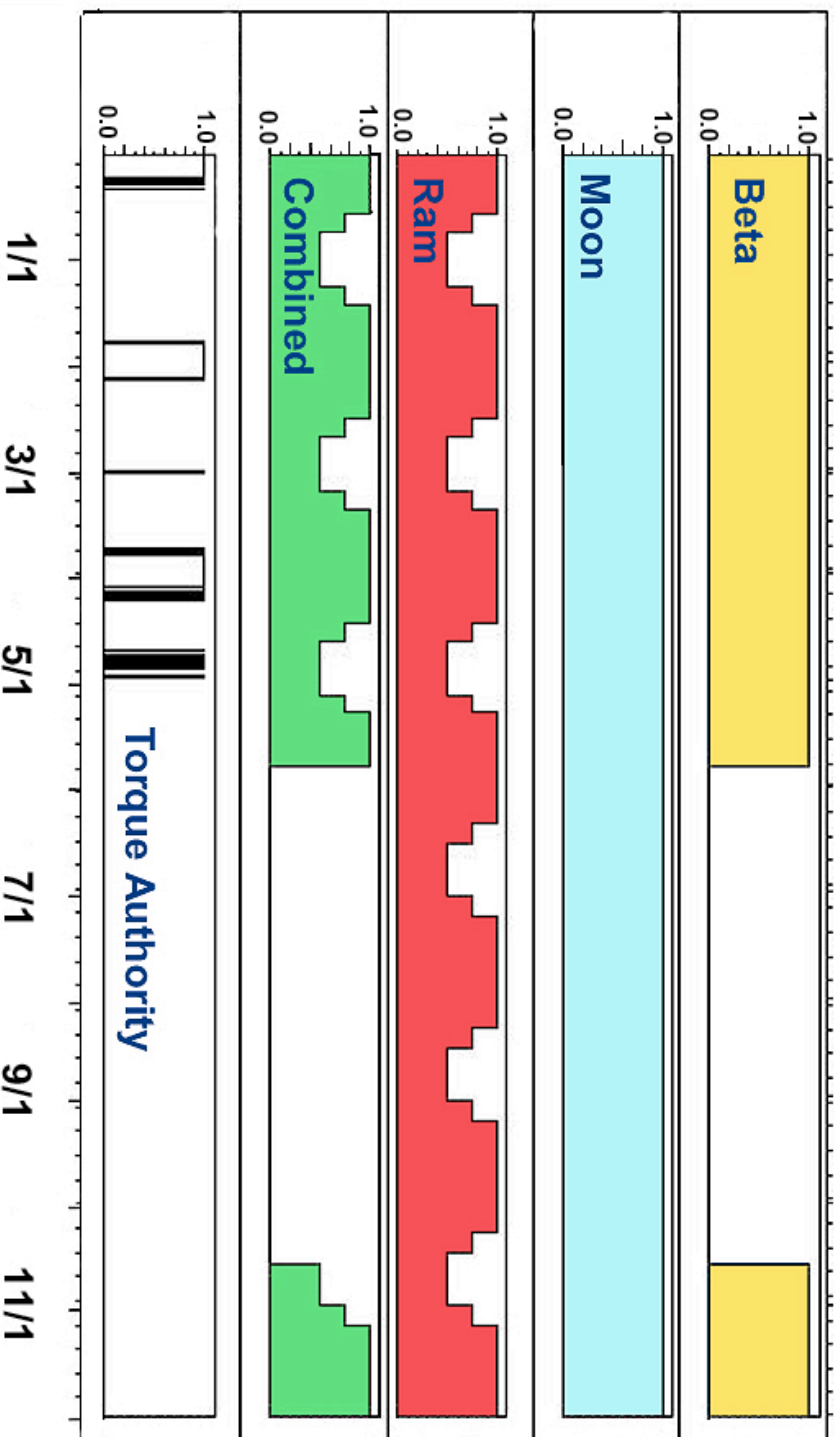
FUSE Mission Planning

- Two step process: long range planning and short term scheduling.
- Scheduling constraints:
 - Anti-sun (“beta”) angle: $30^\circ < \beta < 95^\circ$
 - Moon avoidance: $> 10^\circ$ away
 - ‘Ram’ avoidance: $> 20^\circ$ away
 - **NEW: Gravity gradient disturbances and magnetic torque authority.**

Long Range Planning

- FUSE-specific *Spike* software used to provide coarse scheduling of all observations for one year.
- Absolute constraints applied: Sun, Moon, Ram, user-specified requirements, **Torque Authority**.
- **NEW: Standalone program computes Torque Authority scheduling windows for all targets for input to Spike. Plots generated for analyzing scheduling trends.**
- Observations grouped into 7-day bins --> input to short term scheduling process.

Spike Long Range Visibility Plot



Short Term Scheduling

- Mission Planning Schedules (MPSs): set of orbit-by-orbit observations and activities to be performed autonomously by FUSE. MPS's converted to spacecraft commands and uplinked.
- Additional constraints: Earth occultations and SAA passages.
- **NEW: Standalone programs check MPS for torque authority during slews between targets and also verify there is sufficient torque authority during the observations.**

Mission Planning Now

- Scheduling process involves manual analysis and iteration, especially for targets at lower declinations.
- All initial low declination tests successful.
- Low declination targets possible as “limited resource” (additional constraint on observation).
- Working to integrate new standalone programs into the existing long range and short term scheduling software.

Annual Sky Availability

