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To: MIT XIS Team
From: Mark Bautz
Subject: XIS Team and AstroE2 Science Working Group Meetings at ISAS, 10-12 December 2001

Besides the three MIT participants (Bautz, Doty and Ricker), the meeting was attended by Tsunemi, Koyama, Tsuru, Dotani, Ozaki, Hayashida and Awaki. Some highlights:

Personnel changes on Japanese XIS Team (Koyama): Matsumoto-san has moved to Kyoto and will be looking after the XIS there. In addition, Murakami-san, a new post-doc at ISAS, will also be joining the XIS team very soon.

MIT Report (Bautz): Materials I presented are available at

`ftp://space.mit.edu/pub/xis/meetings/isas_10_Dec_2001.`

These presented our case for including charge injection capability in the XIS CCDs. This proposal was accepted by the team. Koyama-sensei noted that his acceptance of charge injection was subject to the reservation that we meet existing cost and schedule constraints. I also described the BPSG problem and its effect on low-energy detection efficiency. The team urged us to do everything possible to minimize the thickness of the BPSG layer.

AstroE2 Status Summary (Dotani): The design of each spacecraft subsystem has been finalized. Major changes from AstroE are as follows:

1. Different, lower-vibration momentum wheels (manufactured by Honeywell) will be used in an effort to minimize microphonics in the XRS. Vibration is expected by reduced by a factor of 10.
2. The XRS will use a mechanical cooler developed by Mistubishi Heavy Industries. This cooler is the one developed for the SELENE mission and is a single-stage Stirling cycle. Expected XRS lifetimes depend on cooler operation duty cycle, and are 1.9yr, 2.5yr and 3.7 years for duty cycles of 0%(cooler failure, 50% and 100%, respectively. Microphonic interference may limit the cooler duty cycle to of order 50%. The cooler requires up to 55W when operating. At 30W input power, 2.0 W can be lifted from a cold-end temperature of 100K.
3. The X-ray telescopes will be fitted with stray-X-ray-light baffles to reduce response to single and triple bounce X-rays from large field angles. The aluminized plastic thermal shields used on AstroE will be retained for AstroE2.
4. Spacecraft weight is 1702 kg, power is 661W, without margin. This represents an increase of 32kg and 99W relative to AstroE. While the rocket lift capability is expected to be larger than for Astro-E, the mass budget will be limited by the spacecraft/3rd-stage interface to about the existing level.

5. The rocket nozzles of all three stages of the MV have been redesigned. Tests of all three stages should be completed by the end of 2001. The first flight test of the revised MV will occur in December, 2002 when MUSES-C is launched. AstroE2 will be the fourth launch of the revised MV (after Lunar A in 2003 and Astro-F in 2004).

XIS Digital Electronics (DE) status (Dotani): MHI has already built prototypes of both MPU and PPU, and the basic hardware functions have been confirmed. The software will include countermeasures to work around the known HK bug in the AE FPGA.

Additional XIS Calibration Source: A second XIS calibration source will be incorporated in the XIS door. This source will be designed to illuminate a portion of the CCD when the door is closed, and to illuminate none of the CCD when the door is open.

Schedule (Tsunemi): The spacecraft integration and test schedule will be made available on the web by Tsunemi. It has not changed since our last meeting. A discrepancy continues to exist between the MIT delivery schedule (September 2003) and the spacecraft integration and test schedule need date (probably July or August 2003).

Flight H/W transportation: Since hand-carrying of flight hardware on commerical passenger flights is likely to be problematic, we discusssed alternatives. No conclusions were reached. The XRS team noted that they plan to accompany their hardware on a commerical (JAL) cargo flight.