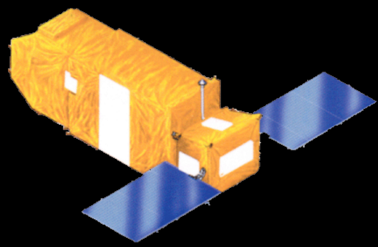
FUSE

Johns Hopkins University

FOAC Meeting-Oct. 10, 2003



FUSE Mission Status

Bill Blair

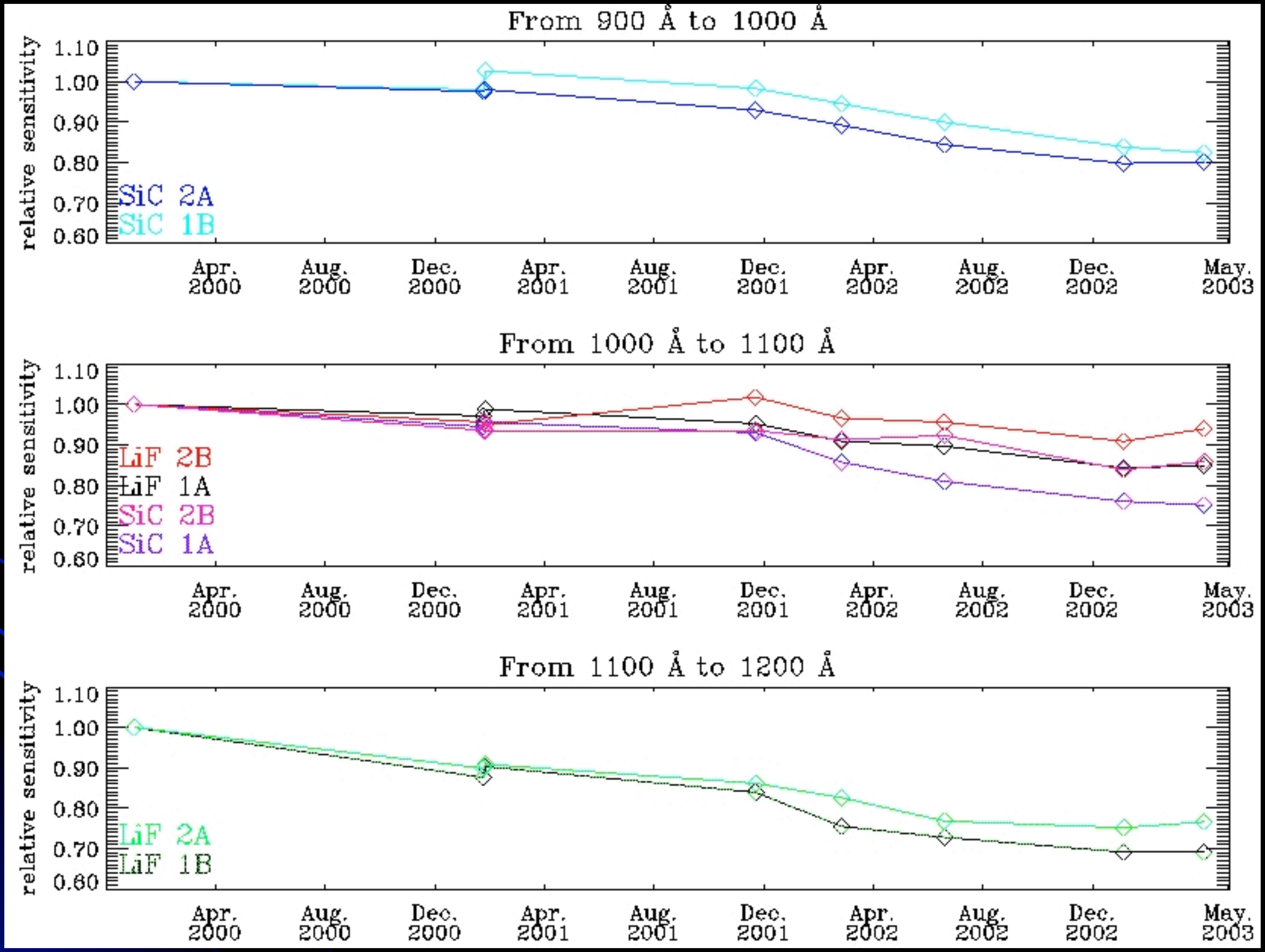
FUSE Deputy PI

Chief of Observatory Operations

Recent Performance

- Statistics for EM to date (Apr. - Sept. 2003):
  - 24 weeks
  - Total science time: 5425.5 ks (37.4% efficiency)
  - Primary science time: 3489.6 ks (24.0% efficiency)
  - Survey/Observatory: 1935.9 ks (13.4%)
  - Prime and total are both considerably higher than last 6 month period (of Primary mission).
    - Includes 2 extended periods in/near the Magellanic Clouds.
    - Includes Zerogyro code load downtime period.
- Calibration status:
  - Sensitivity remains excellent, although slowly trending down.
  - No detected degradation specific to “Ram dipping” has been seen.

FUSE Sensitivity



Zerogyro S/W Performance

- ZG code load was Apr. 16 (prior to previous FOAC).
- Most testing performed in non-interference mode.
  - FES CR-rejection problem found, fixed.
  - FES reset problem (on-going; being managed by script changes).
  - Tricky balancing of unloading vs. control at moderate pole angles.
    - Variable slew rate implemented to help with this.
    - HDS s/w from Orbital used to model potential problem observations.
- Declared operational in mid-July; press release generated.
- IRU-B “yaw” gyro failed July 30,2003; FUSE remained on the timeline! (Now operating with two gyros.)
- Monitoring of performance has shown a generally minor impact:
  - More reacqs needed; occasional failed acqs and lost time or exposures, but we (usually) stay on the timeline.
- Two significant SPM events (one earlier this week) indicate torque losses and impacts are not yet 100% predictable.

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Data Processing & Archiving

- ZG operations have had negative impact on processing.
  - Missing or incomplete data sets have increased.
    - Can affect LZP step and/or SDP step.
    - Often require human interaction to resolve.
  - FES processing problems (due to FES `hang' problem).
  - Science data assessment s/w flags many "needs attention" data sets that do not really need attention, causing delays.
    - SDA s/w has been reworked to avoid the worst problems.
- MAST ingest difficulties have caused numerous headaches.
  - Delays, multiple re-sends, tracking problems (what got in and what did not), etc.
- Most of these problems appear to be under control.

EM Operations: Ups & Downs

- Effectively, EM operations implementation was delayed until after ZG upload and testing completed.
- SCC Staffing now 16/5 (M-F) instead of 24/7.
  - Automated monitoring and remote access by key personnel.
  - Alignments and special operations now avoid weekends.
  - Getting loads for weekend coverage has been problematic.
  - Has caused significant new constraints on MP.
- SAA detector shutdown recoveries have been automated (in scripts).
- The SAA model assumed has been decreased in size, producing one more “clean” orbit per day!
- NASA IT/security and Risk Assessment analyses.

Risk Assessment

- Loss of another Reaction Wheel.
  - Safety and Science issues both need to be assessed.
  - Answers may depend on “which wheel” goes.
  - Very limited resources available to study this situation.
- Aging and outdated hardware at UPRM ground station.
  - Have had significant problems periodically (including July-Aug 03).
  - Some problem h/w no longer supported by manufacturer.
  - NASA/CSOC and HTSI looking at options. ($$)
- Outdated/unsupported s/w in SCC/ground system.
  - O2 database licensed to specific h/w; O2 no longer supported.
  - Sun OS 2.6 used in SCC; cannot easily be upgraded but no longer supported.

Bright Target Techniques

- **SiC only technique:** has been used several times in the past few months. Is not quite a "standardized" procedure, but is a known procedure that we can now utilize when needed (within human resource limitations).
- **Defocus technique:** One significant attempt at a defocus test in September, but it largely failed due to errors in the script. Enough data from alignment scans to verify that we understand how the images move with defocus. Test is being rescheduled later this month.
- **Lowered HV method:** New technique being studied; has possibility to provide a safer, multi-channel method of observing bright targets. One test to date, partially successful, shows both promise and potential complications.
- **Scattered light technique:** appears very risky. May not be usable in practice (safety and human resource issue).

EM Staffing Changes

- JHU Program Manager, J. B. Joyce, retired 6/6/03; Randy Ewing now Program Manager.
  - Two new business office people. (One less than PM, but two openings as of last spring needed filling!)
- SciOps staffing has decreased/is decreasing.
  - Damian Christian left end of May.
  - Two more budget-driven cuts this winter.
- SCC staffing changes (10 down to 7):
  - MOT Mgr is Steve Vaclavik (Chris Silva to GSFC).
  - Other staff being decreased by two by end of October.
- Contractor support extremely budget limited.
  - AURA/STScI, ICS, Orbital on T&M contracts.
  - ICS (SCC admin, security), AURA (archiving) maintained.

Cy. 5 Carry-over

Programs carried over from Cycles 1-4 into the Cycle 5 time period (April, 2004 - April, 2005). These are estimated from the LRP built on 10/2/2003 covering the Cycle 5 period from 4/1/2004 to 10/3/2004.

Observations assigned a Cycle 5 bin in the LRP:

	Observations	Exp. Time (ks)
A programs:	0	0
B programs:	3	51
C programs:	37	347
D prime:	56	881
D survey:	39	462
P programs:	15	120
Q programs:	2	13
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TOTALS:	152	1874 ks

Observations On HOLD

	No. Obs	Exp. Time (ks)	Comments
A programs:	1	45	Titan - will be attempted 11/03.
B programs:	3	49	All unschedulable
C programs:	11	233	Bright & unsched targets
D programs:	34	301	Bright targets, TOO's
P programs:	50	254	Bright & unsched targets; Jupiter (5 obs) - 12/03.
Q programs:	0	0	
Z programs:	1	20	Z005 - awaiting activation by PI
TOTALS:	87	902	Includes 6 Moving Target obs.

Total Carry-Over

	Observations	Exp. Time
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A programs:	0	0 ks
B programs:	3	51 ks
C programs:	37	347 ks
D programs:	96	1383 ks
P programs:	15	120 ks
Q programs:	2	13 ks
On HOLD:	81*	785 ks*
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TOTAL:	234	2699 ks

*6 pending Moving Target observations removed.

(Information courtesy of Alice Berman, FUSE MP.)