

# Solar Electron and Proton Telescope (SEPT)

## Sensor Status

Reinhold Mueller-Mellin, University of Kiel

*IMPACT team meeting*

*Space Sciences Laboratory, Berkeley, CA*

*December 14, 2001*

# SEPT Sensor Status

- Conceptual design ready.
  - Details of housing and cover release ready
  - Details of detector mount ready, detector masks frozen
  - Magnetic field calculations ready
- Change of S/C layout accomodated
  - SEPT-E and -NS both separated from SEP
  - Harness length established
- Funding secured
  - Funding agency informed about 1-year launch delay
  - Not yet covered: extra expenditures resulting from configuration change (environmental tests)

# SEPT Sensor Status (continued)

- Project engineer hired
  - Supports mechanical design, detector tests, magnet tests. Started 2-JUL-2001. Name: Jörg Falenski
- Technical Assistance Agreement (TAA) revised
  - Not yet signed because signature copy not yet received
  - Signature copy expected by end of 2001
- First magnet system delivered
  - Passed visual incoming inspection
- Workshop started machining first parts for ETU housing

# Major Accomplishments

- SEPT mechanical redesign to reflect:
  - New board size causing E-box outer dimensions to shrink
  - Rotation by 90° of E-box w.r.t. sensor
  - Addition of sensor thermistor with coax cable to E-box
  - New location for 12 detector connections at front/rear wall instead of top wall of E-box
  - Addition of grounding stud
  - New mount for thermal insulation
  - Cover release mechanism (was not included in sufficient detail before)
  - New pinpuller (Model P5-403-10S replaces P5-403-10)
- Triax cable ordered and delivered, coax connector identified (SSMC)
- Mask design for PIPS detectors frozen, two detectors fabricated
- Analytical calculation of magnetic far field with magnet mismatch

# SEPT Resources

Subsystem	Mass [kg]		Power [W]		Bps
	IMPACT Resources. pdf	Current	IMPACT Resources. pdf	Current	Phase A Current
SEPT-E	0.520	0.556	0.500	0.500	30
SEPT-NS	0.520	0.556	0.500	0.500	30
SEPT-NS Bracket	0.27	0.27			
SEPT-NS Harness	0.242 0.372	0.224 0.342	S/C A: 2.13 m (25 wires, 1 coax) S/C B: 3.48 m		
SEPT-E Harness	0.128 0.272	0.120 0.251	S/C A: 0.94 m S/C B: 2.44 m		

# SEPT Sensor - Upcoming Tasks

- Order pinpuller from TiNi Aerospace/California
- Contract out multi-node thermal analysis
  - Needs SEP thermal concept definition
- Contract out finite element structural analysis
  - Needs STEREO Environment Definition (released 11-May-01)
  - Needs GSFC bracket design
- Order Parylene film
- Verify compatibility of detector signal characteristics and analogue electronics design

# SEPT Sensor Concerns

- PDR RFA # 29: Stray light problem
  - Ohmic side face open space
  - Verification open
  - Possible solution: perform solar simulation test
- PDR RFA # 13: Magnetic cleanliness
  - Far field analysis completed, including magnet mismatch
  - Solution:
    - Perform magnetic measurement with Mario's test equipment
    - Select magnets for matched magnet system

# SEPT Sensor Concerns (continued)

- Rare Earth NdFeB may be magnetic unstable due to drifts with temperature or handling. Cerium Cobalt is preferred by Mario. Impact of change to new magnetic material may be severe:
  - Weight increase: Lower remanence requires larger magnets
  - Cost increase: All magnets are already ordered
  - Schedule delay: new geometry requires new telescope design
- Thermal analysis predicts unacceptable wide temperature range. Op-heaters and non-op heaters are required. No provision is made to install them **inside** of E-box!