Dave Braun's RFA's

Pre system PDR mechanical peer review October 3, 2013

Heritage to Stereo and numerous flight instruments ASTRO-H like electronics
ACE

Requirements not shown. Particularly, thermal temperature ranges op, non-op, survival. Launch temperature. So we had to rely on a verbal argument that the tolerance stackup method is sufficient to meet alignment requirements

Temperature predicts not shown
G10 and Polyimide annulus detector mount with Shinsitsu adhesive compliance non-conductive 1 to 2 mil bond line

Acoustic test +6 dB over Atlas environment (4 times power) prescreen acoustic test on detector

ISIS PDR November
Solar probe PDR a little later….

Operating -30 to
Non-operating -40, +40?
Survival?
3 months/ thermal cycle
7 years

1. Concern: There is a redundant load path on board mounted connectors (mounted to chassis walls, too) which is not good board mounting practice and will result in mounting and thermal stresses to board and perhaps add stress electrical connections.

   Suggestion: Consider moving connectors off the board to add compliance between the connector and board.

2. Concern: detector and foils may go out of flat over temperature range due to material CTE differences causing performance to go out of specification.

   Suggestion: verify operating flatness requirement and that it will be met over temperature range.

3. Concern: combined worst case launch thermal load with acoustic may make stress margins negative. Worst case shroud temperature is uncertain. Delta CTE 10.6-2.6= 8. New thinner detector TRL probably not 6 yet.

   Suggestion: Determine launch temperature range and superimpose acoustic stress with thermal analysis if not insignificant. Present margins at CDR.

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4. Concern: pressure decay profile and vent area analysis not shown. Resulting detector load, superimposed on temperature and acoustic stress may make detector stress margins go to negative.

   Suggestion: perform pressure profile analysis and present margins at CDR.

5. Concern: detector alignment requirements and tolerance stack ups were discussed but not shown.

   Suggestion: make sure to complete, if not already

6. Concern: Pointing requirement, error budget, and verification plan needs to be told. S/C needs to know what verifications they need to perform for verification planning.

   Suggestion:

7. Concern: Instrument may slip at S/C interface going out of alignment

   Suggestion: refer to NASA specification for threaded fasteners NASA-STD-5020 for assumptions to bolted joint analysis and show positive margins to slipping at CDR

8. Concern: mass plus uncertainty has no margin. At PDR typically 20-25%. 20% held at system level not consistent with NTE allocation (which matches CBE +20%).

   Suggestion: if you exceed the NTE ask for more mass before spending time/money on mass reduction