Collateral Environment Measurements

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SUMMARY of GROUP SESSION

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- ~ 13 group members: .gov, .edu, .com, .mil
- Programmatic questions (partnering, funding,queuing of SET experiments …)
- Carrier architecture questions
- Available and pending instrumentation
- “Proven” vs “Developmental” instruments
- Miniaturization

Collateral Environment Measurements

- Experiments will determine
  - environment (orbit) required for validation
  - environmental parameter measurements
  - required suite of environmental instruments
- Specification of environmental instruments should follow experiment and orbit definition
- Solar cycle phase, as well as orbit and short term magnetic activity, will obviously control severity of environment

Collateral Environment Measurements

- Ideas tossed around
  - well calibrated instruments
  - uniformity between SET missions
  - suite of core instruments
    - coarse energy resolution, omni-directional
    - provide overall monitoring of environment
  - experiment-specific instrumentation
    - high resolution over specified E range
  - modularity of instruments ?
  - placement of RadFETS, mini-fluxmeters, thermistors for local dosimetry / temperature
  - coordinated w/ dosimeter for dose-depth curves

Collateral Environment Measurements

	SUMMARY CHART OF SPACE ENVIRONMENT DETECTORS REPRESENTED BY SUBMITTED LWS/SET FORMS				
PARAMETER	EFFECTS	measure	Dose	Flux	LET
Plasma (eV - 10 keV)	spacecraft potential - charging	x		x	
Electrons 10-100 keV	spacecraft surface charging	x		x	
Electrons > 100 keV	deep dielectric charging; solar cell damage; sensor bkd.	x		x	
Electrons > 1 MeV	radiation dose	x	x	x	x
Protons 0.1 - 10 MeV	surface damage to materials; displacement damage in solar cells	x		x	
Protons > 10 MeV	radiation dose ; displacement damage ; sensor bkd.	x	x	x	x
Protons > 30 MeV	damage to biological systems ; Single Event Effects (SEE)	x	x	x	
Ions > 10 MeV/nuc.	SEE ; hazards to humans in polar flights and deep space	x			x
Atomic oxygen	material degradation	x			
UV, EUV					
Micrometeoroids, dust					
Secondary neutrons	SEE	x			x
B field	(depending on details required by experimenters)				