AeroCube-6: A Brief Overview And First Light

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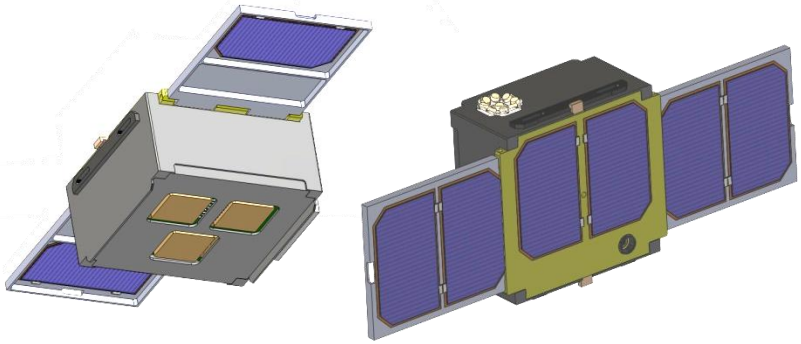
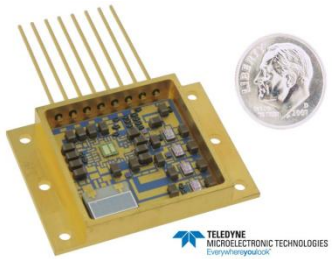
AeroCube-6*



- AeroCube-6 is two 0.5U cubesats
- Science goal: measure spatial scales of radiation in LEO
- Launched June 19th
- 620 x 720 km x 98°
- Payload: 3 dosimeters on each satellite
- Including 3 new variants that have never flown before
- Nominal sample rate is 1 Hz
- Dosimeters A1 and B1 can burst at 10 Hz
- Using differential drag technique to modify spacecraft in-track separation

Dosimeter Payload:



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S/C	ID#	Dosimeter	Measures
A	A1	Thin Window Low LET Variant	>50 keV electrons & >600 keV protons
	A2	Thin Window High LET Variant	>600 keV protons
	A3	Standard Teledyne	>1 MeV electrons & >10 MeV protons
B	B1	Thin Window Low LET Variant	>50 keV electrons & >600 keV protons
	B2	Thin Window High LET Variant	>600 keV protons
	B3	High LET Variant	>10 MeV protons

*Also known as CubeRad, which refers to the dosimeter payload

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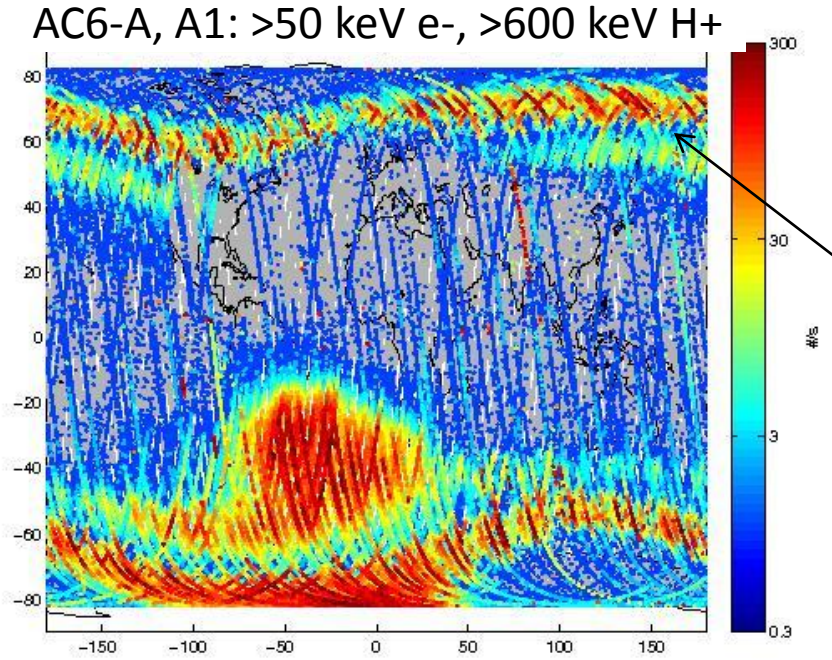

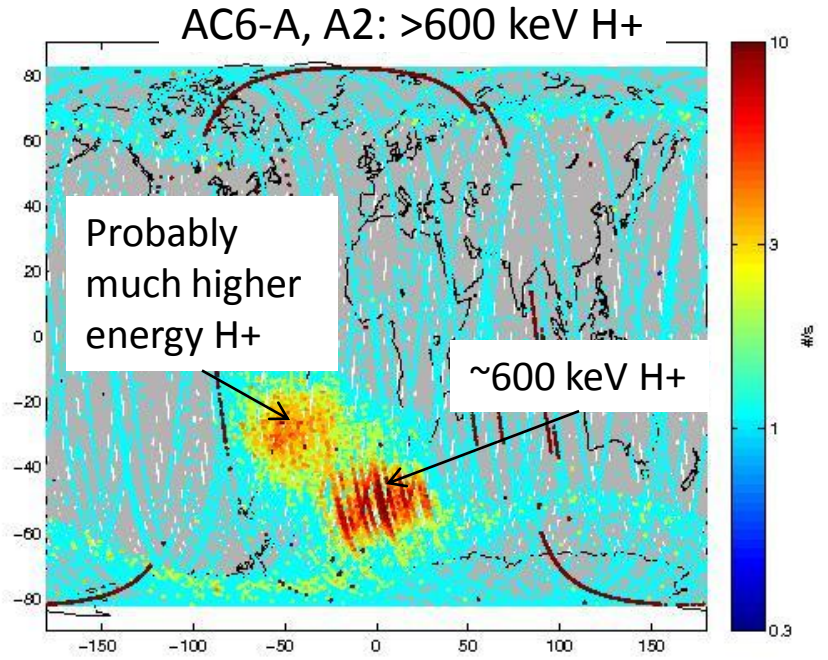

Example Data (I)

- We see the split outer zone in the >50 keV electrons
- We see a low energy proton belt in the slot
- These are all data from A1 and A2 dosimeters
- There's still occasional noise, yet to be flagged

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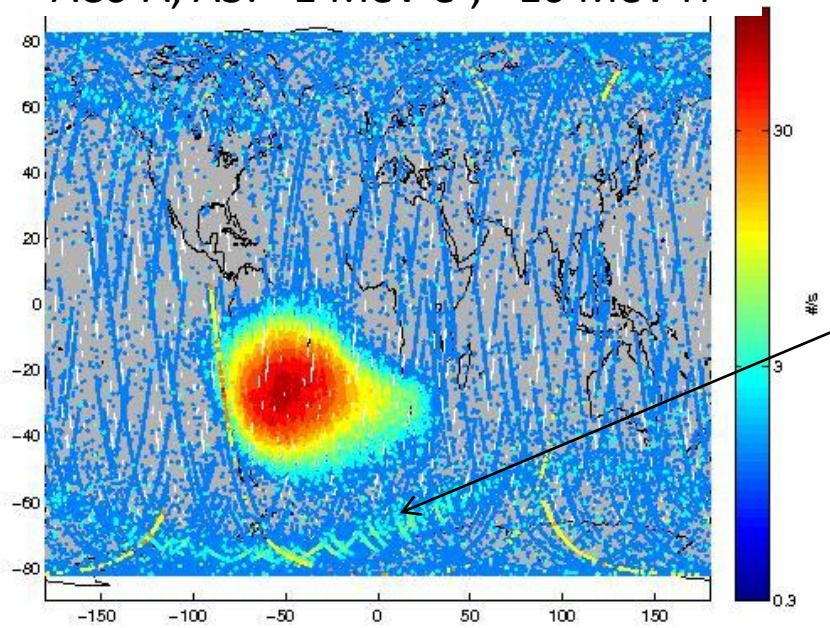
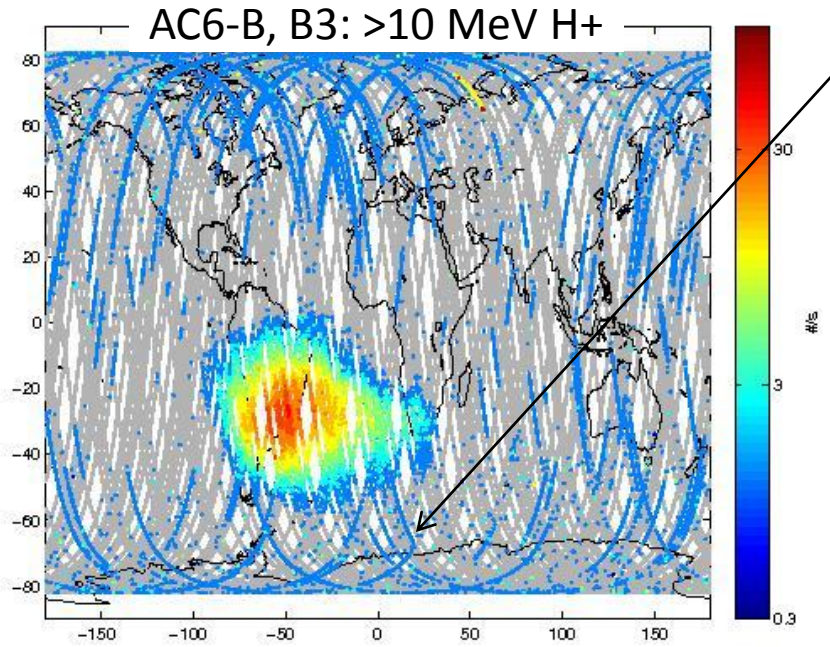
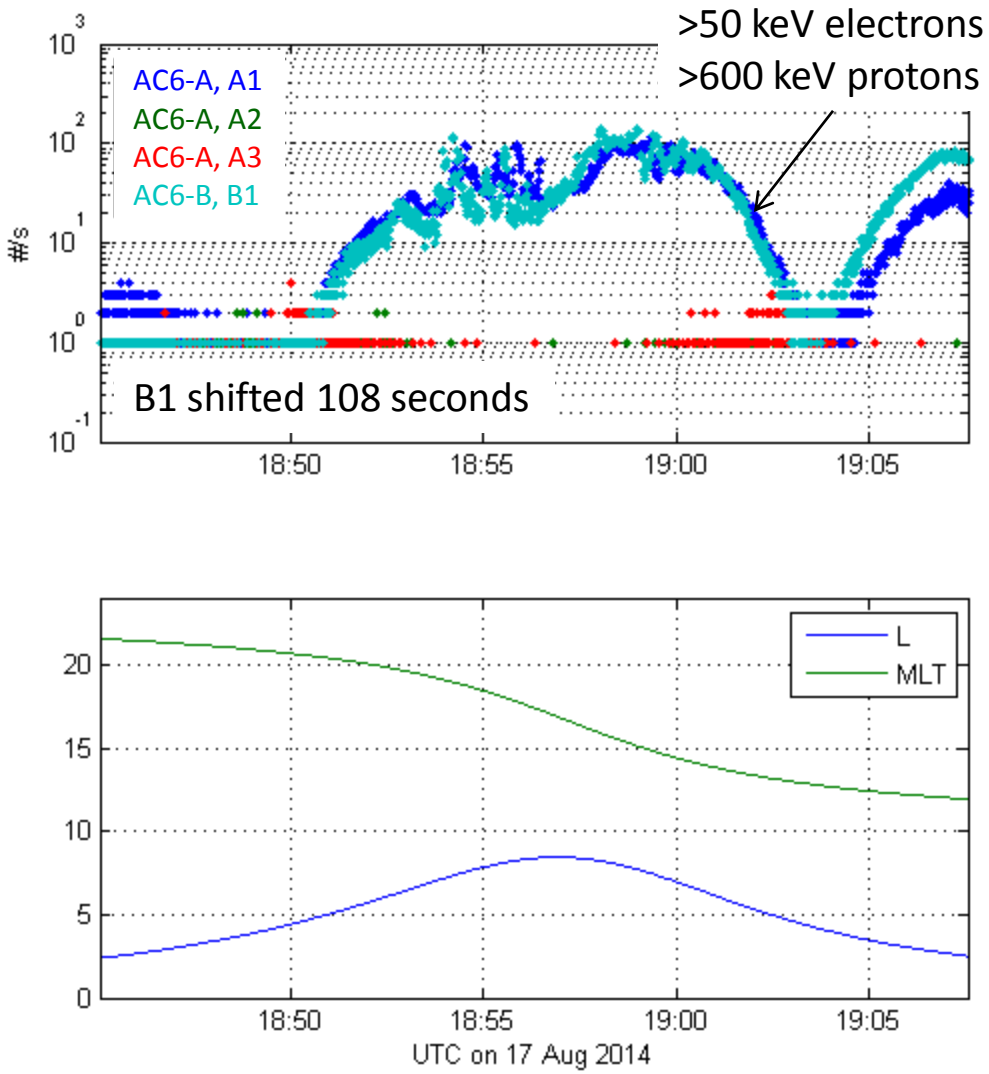




Example Data (II)

- The >1 MeV outer zone has been pretty weak since launch
- The “Hi LET” filter is effectively removing the electrons
- There’s still occasional noise, yet to be flagged

Example Data (III)



- Here we see structured >50 keV electron flux in the outer zone near L~7
- The structure persists for at least a couple minutes
- The structure depends on local time
- There is no signal in A2, A3, B2, or B3, so these are almost certainly >50 keV e-

Summary

- CubeSats can be used to prove new small sensors
- The data look promising: we are getting enough counts that we should see microbursts in the A1 and B1 dosimeters when we schedule burst mode
- We see persistent, fine-scale structure in the outer zone
- As the mission matures, we should be able to perform statistical studies to characterize spatial scale lengths
- A data release policy is in development

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