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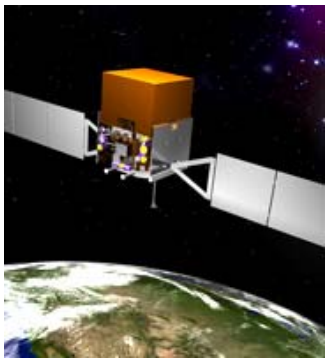

Status of the Background

Review DC2 prep meeting:

- Switch to CRflux package by Mizuno for charged particles, Earth by Petrie for gamma
- Report on 8 sampled orbit-seconds from default orbit: indicated that the rate is 8 kHz, downlink 450 Hz. *NOTE: this was a preliminary status, not a prediction!*
- Reason for 2X increase from PDR seems to be trapped positrons.

Update here:

- ~80 sampled seconds from full DC2 orbit
- Analysis of trigger bits

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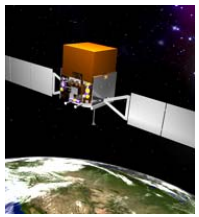
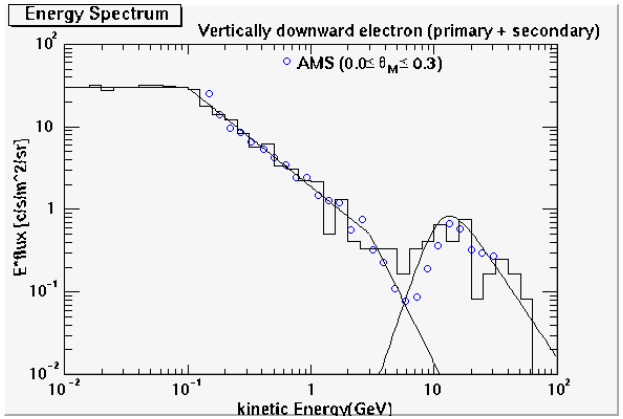


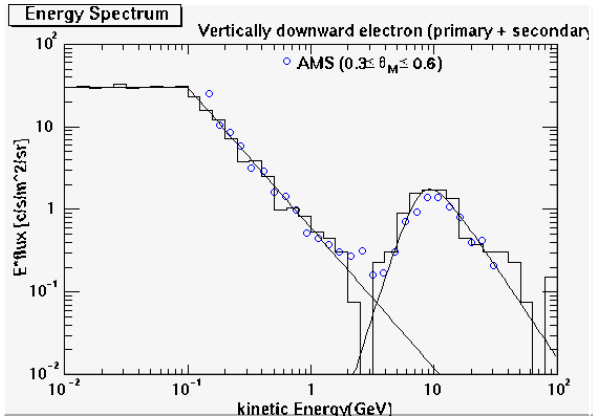
The electrons and positron fluxes: Mizuno's plots

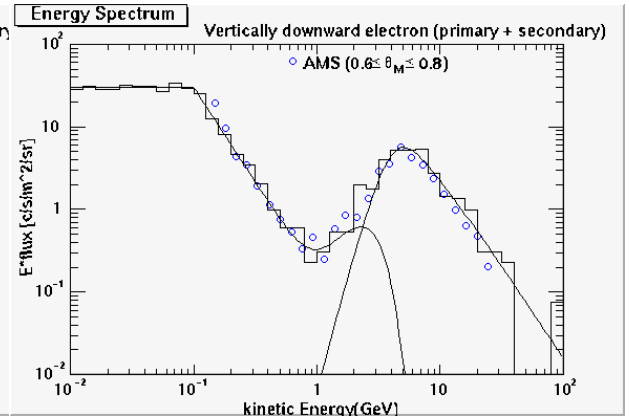
Geomagnetic latitude

low **medium** **high**

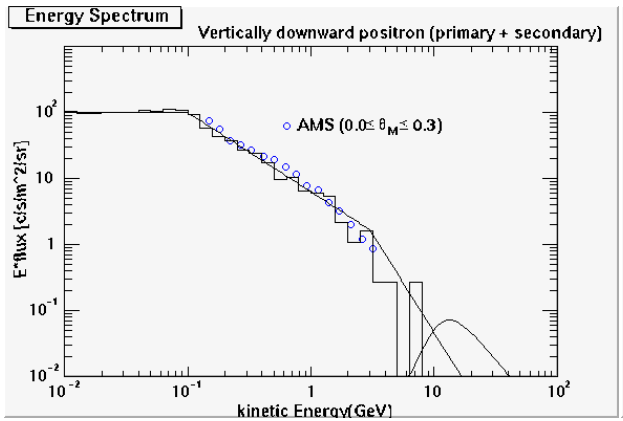
electrons

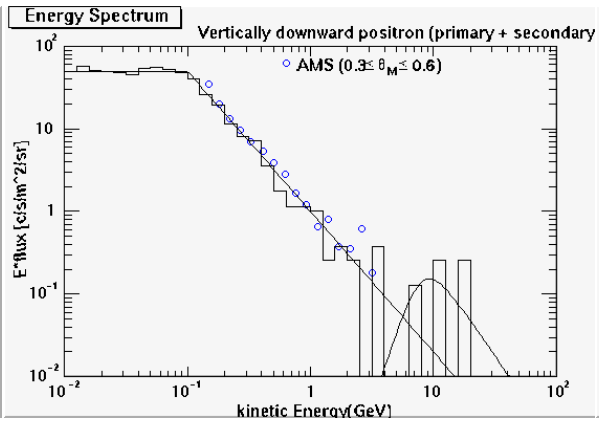


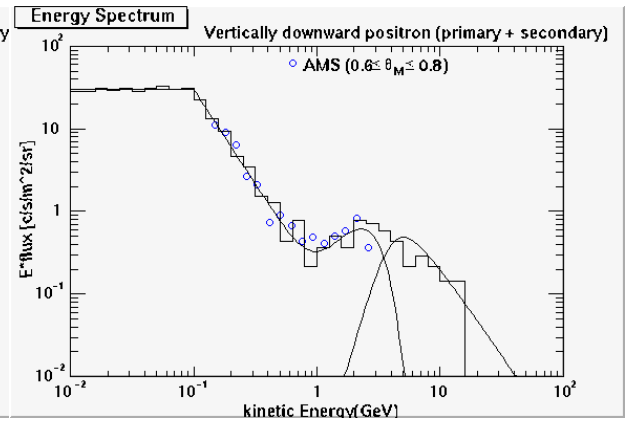


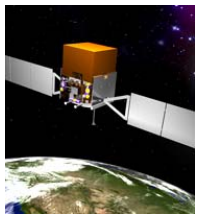


positrons









Electrons and positrons

- Questions:
  - Why the big asymmetry?
  - Why are fluxes so large?
  - Why is it isotropic?
  - How does the flux depend on altitude?
  - Why is the flux largest at low geomagnetic latitudes?
- The model:
  - Secondary particles generated by primary protons near geomagnetic poles, were flux is highest
    - E-W effect explains the charge asymmetry: protons are curving down due to field, positive secondaries bend up, negative down.
  - Secondaries are then trapped by field, accumulate in flux tubes: explains
    - large flux (multiple traversals of a target by single particle)
    - isotropy.
    - Largest near equator?
- Data only at Shuttle altitude, AMS: does it increase??

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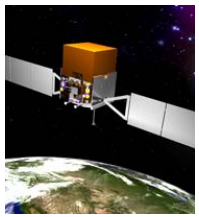
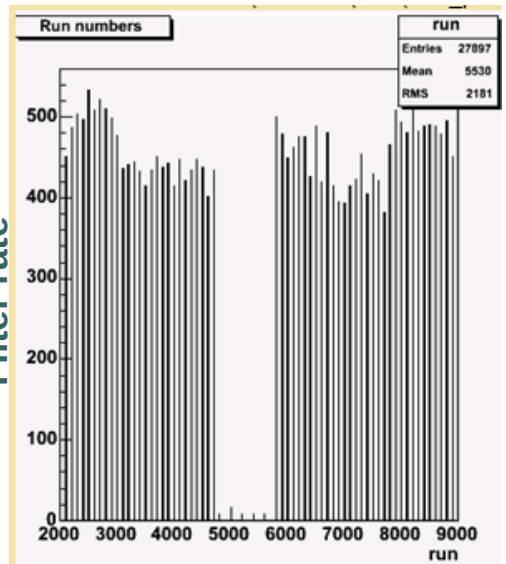


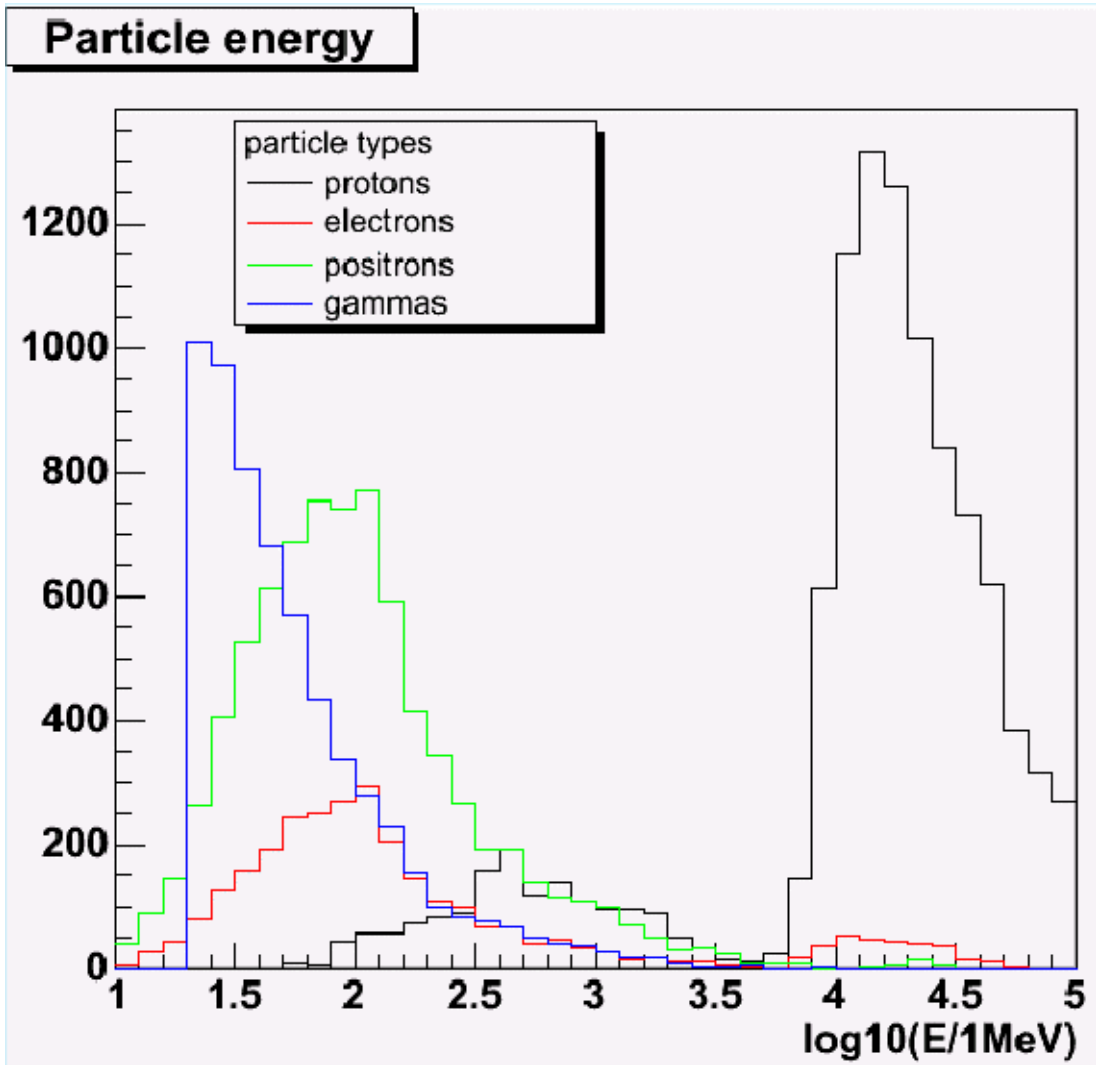
Breakdown of filter output according to source

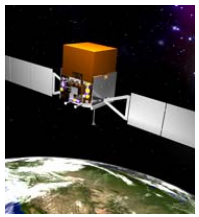
1/100 sampling of an orbit

All “triggers”, no throttle, includes “LOCAL”



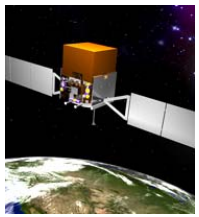
run: second # after launch (~6000 runs/orbit)





What about those trigger rates?

- 8 kHz is unacceptable, 25 μs deadtime → 20% loss
- Oops, it included LOCAL only, contributing ~800 Hz
  - LOCAL is not currently valid, due to use of calibration constants
- How about that throttle! Kill a TKR if:
  - "Ritz": ACD tile associated with triggering tower fires [carefully implemented in code by David Wren]
    →2.2 kHz (preliminary, of course)
  - "Atwood": ACD and no LOCAL.
    →2.0 kHz (ditto)



Ongoing stuff at UW

- Better (automatic) trigger bit analysis
- Finish classification trees
  - Define set for PSF/Aeff analysis
  - Allow analysis of throttle implication for Aeff
- More data!
  - First orbit is flawed, trigger bits were not saved
  - Second orbit almost ready