Status of Trigger Rate Studies

Analysis Group meeting

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Moving from pdrApp to Gleam: Fluxes and Trigger Rates

- Purpose: we want to use GLEAM for background studies
  - onboard filter development
  - revisit ground-based background rejection

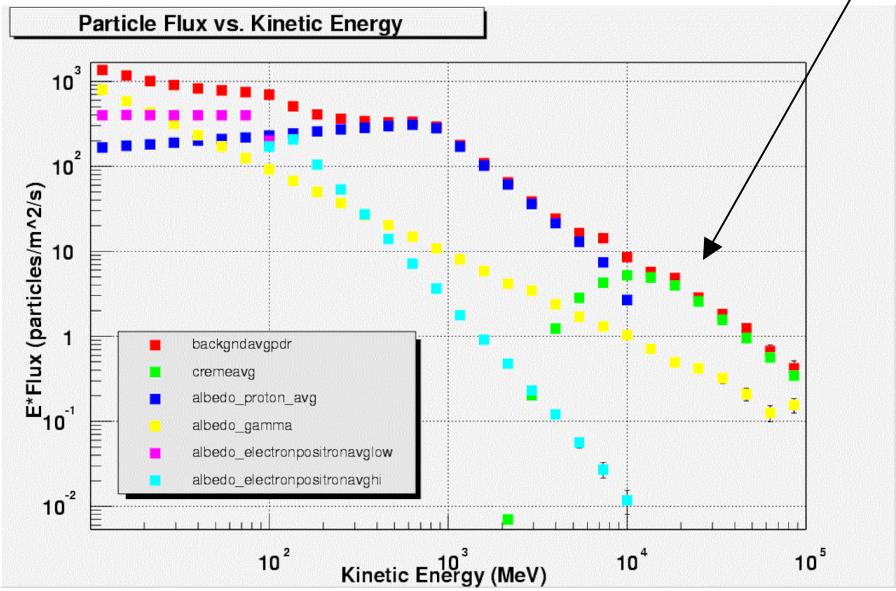
so the first step is to verify the implementation of the background fluxes.

=> compare with pdrApp

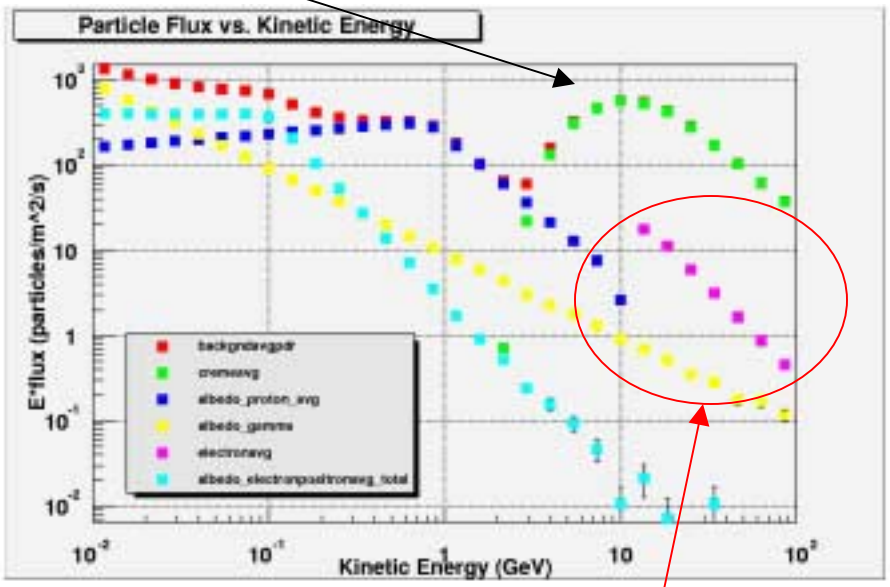
- Look at backgndmaxpdr (orbit max) and backgndavgpdr (orbit average) composite fluxes:
  - Compare Fluxes (Gleam vs. pdrApp)
  - Compare L1T rates (Gleam vs. pdrApp)
- Tools:
  - Use rootplot (within FluxSvc package) to plot fluxes
  - Use Gleam event tuples to get L1T trigger rates

backgndavgpdr flux comparison

cremeavg in Gleam v3r2 low by factor of 100 – fixed? Stay tuned!



Gleam v3r2



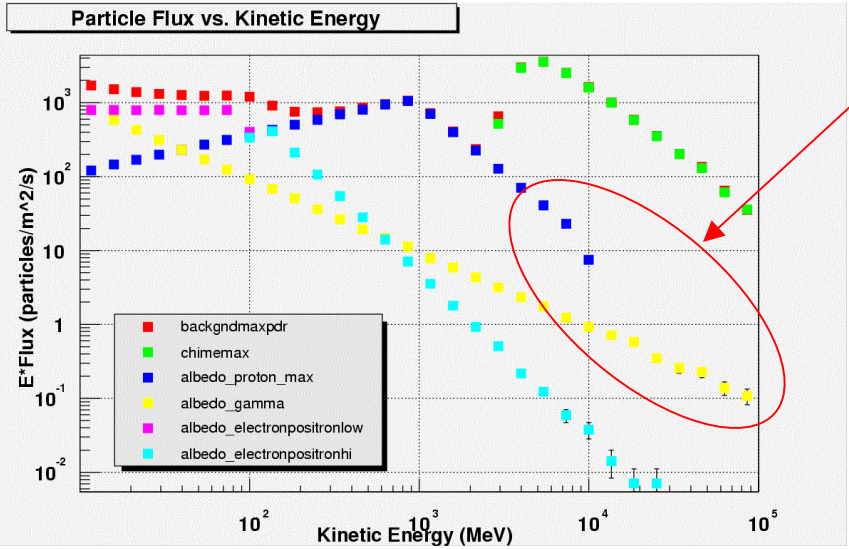
pdrApp

No CR electrons yet in Gleam

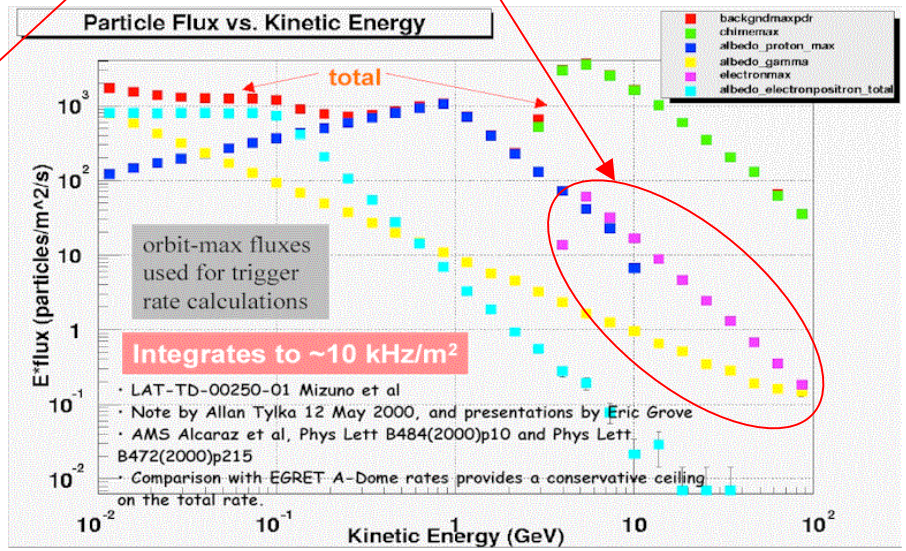
Otherwise, apparent agreement

backgndmaxpdr flux comparison

Gleam still lacks CR electron flux



Gleam



pdrApp

Otherwise, apparent agreement…

backgndmaxpdr fluxes from rootplot

Flux Type	Integrated Flux (kHz/m^2) in Gleam	Integrated Flux (kHz/m^2) in pdrApp
backgndmaxpdr	9.9	9.9
chimemax	4.2	4.2
albedo_proton_max	2.6	2.6
albedo_gamma	0.92	0.92
electronmax	X	0.043
albedo_electronpositron_total	2.2	2.2

HOWEVER…

Current Backgndmaxpdr L1T Rates

Rates by Trigger Type vs. Flux Source for Gleam and pdrApp

Gleam	Total	chimemax	albedo_p_max	albedo_gamma	electronmax	albedo_e+e-
Flux (kHz/m^2)	9.87	4.17	2.59	0.92	NA	2.2
L1T rate (Hz)	**5070**	**46**	3014	215	NA	1782
L1T (fract)	1	0.01	0.59	0.04	NA	0.35
TKR rate (Hz)	4813	44	2790	196	NA	9.7
CAL-LO rate (Hz)	492	22	549	26	NA	14
CAL-LO and NOT TKR	257	2.43	223	18	NA	0
CAL-HI rate (Hz)	2.77	0	0	0	NA	0
CAL-HI and NOT TKR	0	0	0	0	NA	0
pdrApp						
Flux (kHz/m^2)	9.9	4.2	2.6	0.92	0.043	2.2
L1T rate (Hz)	13134	7419	3501	242	79	1893
L1T (fract)	1	0.56	0.27	0.02	0.01	0.14
TKR rate (Hz)	11221					
CAL-LO rate (Hz)	5297					
CAL-LO and NOT TKR	1913					
CAL-HI rate (Hz)	84					
CAL-HI and NOT TKR	10					

There is a problem with the chimemax rate (also a factor ~100 low)

Summary

- Most of the flux components look OK. Tools are very useful. However, don't use GLEAM yet for background rate studies:
  - Still a problem with orbit avg and orbit max CR proton fluxes, and CR electron fluxes not yet implemented.
- Today's mystery: why the chimemax rootplot looks OK, but resulting rate is still low. Could be gleam package use problem (still loading old dll?). [Single-event display used to confirm this is not some obvious problem such as sphere size, etc. Events look OK, just wrong rate.] Should be sorted out this week.
- Nested composite sources not yet working (lower priority).