

Filter Requirements

Objectives from the LAT Performance Specification Document relevant to filter testing:

- Effective areas for normal incidence photons at 20 MeV, 100 MeV, and 300 GeV should exceed 300, 3000, and 6400 cm², respectively
- Peak effective area should exceed 8000 cm²
- The field of view should exceed 2 sr

The filter should provide the capability to limit the science data volume to 104 Gbits in any given 24 hour period.

The deadtime contribution from the FSW should be less than 0.5% at 1 kHz trigger rate and less than 5% at 10 kHz for normal operation. For GRBs with 1 kHz gamma rate the deadtime should not exceed 25%.

Testing for the Effective Area / FOV

Run simulated events on the FES:

- Normal incidence photons at 20 MeV, 100 MeV, and 300 GeV
- Normal incidence E^{-1} photon sample
- Isotropic E^{-1} photon sample from the upper hemisphere

Will verify formal objectives as well as target performance numbers suggested by Steve Ritz (see Feb 28 VRVS meeting minutes).

Will check “good gammas”. Tentative definition from Steve/Bill is $\text{CalEnergySum} > 5 \ \&\& \ \text{TkrNumTracks} > 0 \ \&\& \ \text{CalCsIRLn} > 2$.

Testing for Data Volume / Deadtime

- Plan to generate typical and high background orbits (or fragments) to check the data volume
- Need to understand what will be available and when in terms of the background model
- Will test for the filter contribution into the deadtime by running background/background+GRB samples on the FES at high rates and comparing the real and the “Poisson” filters