Preliminary calculations assume:

satellite and into the ACT detector. GEANT 3 to propagate the incident radiation through the MGGPOD then using Monte Carlo techniques based on distribution for each background component in a format that background spectra, the albedo photon spectra, and the These inputs are used by an IDL program which then proton spectra incident on the satellite.

What we developed:

Background Simulations of Advanced Compton Telescopes

Abstract:

The Advanced Compton Telescope (ACT) is being investigated to address the promising significant progress in the field of observational nuclear gamma-ray astronomy. An BIG BLACK BOX

Components of the space background:

Photon background:

– Geomagnetic cutoff parameterized for COMPTEL orbit
– Fits to balloon data were used to find spectra that agreed with the

Trapped protons:

– The hadronic component of the CR background is calculated by

Leptonic:

– The leptonic component is calculated in our IDL routine starting with a

Output from CREME96

\( F(E) = 40.0 \ E^{-2.75} \) for 30 keV < E < 50 keV
\( F(E) = 40.0 \ E^{-1.86} \) for 50 keV < E < 100 GeV

More importantly, we have not begun to explore the many possible data selections that are expected to greatly reduce the background.

The results shown above illustrate that we have succeeded in producing a working system that is capable of simulating the complex, optimal detector size and configurations for ACT instrument development.

We have constructed a tool that will allow a user to start with the orbital parameters of their instrument and predict the background.

We predict instrument response and characterize background created by decay of activated components.

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