

Symp2007BackgroundPoster

Response of the GLAST-LAT Calibration Unit to sources of background

In preparation for the [GLAST Symposium](#) Link to current DRAFT : [BackgroundPoster_FINAL](#)

Abstract

The main sources of background for the operation of the GLAST-Large Area Telescope are primary protons, albedo gammas from the earth and photons coming from interaction of positron and protons in the micro-meteorite-shield (MMS) surrounding the LAT, which create photon pairs through annihilation and π^0 decay.

An extensive beam test campaign was performed in summer 2006 on the LAT Calibration Unit (CU), a detector built with flight spare parts of the LAT; the goal of the program was to support the LAT Instrument Calibration by providing direct measurements of the physical processes taking place in the CU detector when exposed to different beams, by comparing the obtained measurements with Monte Carlo predictions and by eventually validating the full LAT MC code used to provide instrument calibrations and background rejection strategies.

The study of the signal produced in the CU by sources of the LAT background was performed with photon beams shot from the side of the CU, proton beams and positrons beams reaching the CU after crossing an MMS target.

Results from analysis of these data are presented in this talk.

Responsible persons : Johan Bregeon, Carmelo Sgrò

People interested (*Please Add your name here if you want to contribute*)

- Johan Bregeon : hadronic interactions, albedo gamma
- Carmelo Sgrò : positron annihilation
- Francesco Longo : hadronic process in GEANT4

Preliminary Content (*feel free to modify/comment it !*) :

Introduction :

- Short summary of what background means for GLAST - reference to another poster ?
- General Beamtest setup to study the CU response to background sources

Main Tabs : Study of the different background sources

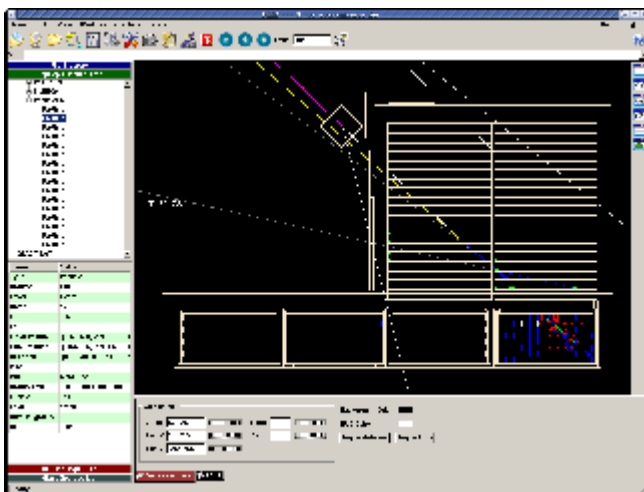
1. benchmark of hadronic process in GEANT4 with proton/pions at PS and SPS
2. hadronic interactions in MMS (PS proton runs)
3. positron annihilation events in MMS (PS positron and electrons)
4. gamma-ray albedo (PS special fullbrehm runs)

Conclusion :

- What we have learned thanks to the beamtest
- How to tune GlastRelease to reproduce better these special classes of events

Material for the poster

- Simulated positron annihilation in the MMS (from BT-1356, event 4040)



Usefull links to presentations and confluence pages

Positrons

- Status Report 15 august 2006 : Luca
[vrvs_15_aug.pdf](#)
- August 18, 2006 : Philippe
[cernps_20060818.pdf](#)
- September 12th, 2006 : Mizuno
[QuickLookPositronElectron_2006-09-12.ppt](#)
- October 11th, 2006 : Gary
[PositronAnnihilations_8-30-2006.pdf](#)
- January 17th, 2007 : Emanuele
[2007_01_17_MMS_Report_Bonamente.pdf](#)

Proton Background :

- Workshop 3 : Bruel
[pisa_dc2_20060629.pdf](#)
- Workshop 3 : Alex
[Blanket_background_III.pdf](#)
- November 8th, 2006 : Alex
[MMS_Alex_110206.pdf](#)

Hadronic processes in mms :

- Confluence page by Alex :
[Hadronic Processes in the MMS](#)

Hadronic models / protons :

- October 18th, 2006 : Johan
[HC_13Oct2006.pdf](#)

GEOMETRY

- Confluence page :
[Geometry on Confluence](#)
- MMS Position :
[MMS_pos.pdf](#)
 - heprep file : cu06mmsPositron
[cu06mmsPositron.heprep.gz](#)
 - heprep file : cu06mmsProton
[cu06mmsProton.heprep.gz](#)
- Calibration Unit Dimensions, August 1st, 2006 :
[Dimensions_CU.ppt](#)

ACD

- Workshop 4 : ACD Backsplash Studies (Luis)
[workshop4_luis.pdf](#)

Background

- Workshop 2, Reminder of Background components : Atwood
[ResidualBackgrounds.ppt](#)
- Bill's DC2 closeout slides [pdf](#) [ppt](#)
- C&A Background page confluence :
[Background Rejection and AeFF](#)
- Irredicible Background
[Tagging Irredicible Backgrounds](#)
- Final version of Background flux review by C&A group
[LATBackgroundReviewcompressed.pdf](#)