LAT paper

Peter Michelson (March 17 e-mail):

Dear Colleagues,

The LAT Collaboration is committed to producing a comprehensive paper on the LAT instrument and the LAT science program before launch; ie., before September 8, 2007. The plan below is to submit the paper to the Astrophysical Journal at the end of September 2006. It will be one of three papers submitted that are associated with the GLAST Mission. The other papers are an instrument/science paper on the GBM and an overview paper about the GLAST mission.

A preliminary outline is also included below.

Schedule for paper:

First draft to science group coordinators: April 6, 2006

Preliminary plans from each science group for figures, plots, proposed to be included in paper (section 4 of outline): April 15, 2006

LAT science group plans for figures, plots proposed to be included in paper: May 1, 2006

First draft of figures and text from science groups: July 1, 2006

Second draft of paper incorporating inputs from science groups: August 1, 2006

Discussion of paper at LAT Collaboration Meeting: end of August 2006

Final draft of paper: September 15, 2006

Submission of paper: September 30, 2006 (goal: acceptance before 1st GLAST International Symposium in February 2007

Nominal scope of contributions from each science analysis group:

The objective should be to summarize the impact of LAT observations on key science questions in each area. This should be done with about 1 page of text (word format, double-spaced) and one to three figures (at most). The groups should also note any tables they propose to include.

LAT paper

The *Large Area Telescope* on the *Gamma-ray Large Area Space Telescope (GLAST)* Mission
Authors: Category 1 paper
OUTLINE
Abstract
1. Introduction
    - GLAST Mission summary
    - Summary of paper
2. Summary of Key Science Objectives
    - 2.1 Understand the Mechanisms of Particle Acceleration in AGN, Pulsars, and SNRs
    - 2.2 Resolve the Gamma-Ray Sky: Unidentified Sources and Diffuse Emissions
    - 2.3 Determine the High Energy Behavior of Gamma-Ray Bursts and Transients
    - 2.4 Probe Dark Matter and the Early Universe
3. Large Area Telescope
    - 3.1 Technical Description
    - 3.2 Instrument Operations
    - 3.3 Instrument Modeling
    - 3.4 Background Rejection
    - 3.5 Telescope Performance
    - 3.6 LAT Data Processing and Data Products
        - .1 Transient Alerts
        - .2 Source Monitoring
        - .3 Catalog
        - .4 Diffuse Model
        - .5 Level-1 Data

(Note: many of the figures and plots in this section will be generated by the Instrument Analysis Methods science group.)

4. Science
    - Short summary and plot(s) from each science analysis group, e.g. catalog, diffuse, blazars, pulsars and SNRs, unide
    - Importance of multiwavelength observations
5. Summary

Blazar topics + LAT assets

1) Population studies, BL Lac, FSRQs estimates
Contribution of AGNs to Extragalactic background
Detection of Radio-galaxies
Assets: Sensitivity, uniform exposure

2) Specific issues regarding blazars (« science goals »)
with a few examples illustrating the foreseen approach

- WHAT is the structure (ingredients/content) of the jet in blazars and radio galaxies?

(a) the content of innermost part of the jet (e+-, baryon load, poynting flux)
(b) composition of gamma ray emitting part of jet (e+-, pe or UHECRs, magnetic field)

- HOW are the X-/gamma-ray flares produced in blazars and radio galaxies?

(a) importance of external photon fields (BLR, accretion disk, torus, CMB, ...) for X- & gamma-ray production
(b) relation between flares to dissipation of magnetic energy

- WHERE are the X-rays/gamma-rays produced ?

Assets: Time scales that can be probed in single-band/broad-band variability studies, continuous monitoring (survey mode).

3) EBL
Assets: Energy range extending to few 10 GeV enabling good determination of the IC peak, "many" high-redshift blazars in the sample