Minutes of the Blazar Working Group Meeting, July 19 2005

Attendees: R.Cameron, A. Chen, J. Chiang, S. Ciprini, C. Dermer, T. Kamae, B. Lott, G. Madejski, J. McEnery, P. Michelson, L. Reyes, R. Romani, G. Tosti.

The presentation slides are posted at:
http://www.cenbg.in2p3.fr/ftp/astropart/glast/agn_group/meeting_page.htm

The meeting has essentially been devoted to a discussion over the different scientific topics covered by the group's activity and the corresponding objectives for DC2.
The following five topics have been identified (see the slides for details). Each should be the subject of at least one pre-launch paper.

1. Blazar catalog, sample definition
This activity will be carried out in close connection with the catalog group. The latter group considers using the figure-of-merit technique developed by Romani et al. for identification, but it is cautioned that non EGRET-like blazarscould be missed in that case.
The tentative list of catalogs put together by the catalog group for source identification is posted at:
http://glast/gsfc.nasa.gov/ssc/dev/catalog_tools/catalogues_potential_list.html
Input from the Blazar group to update and prune this list is requested. The latest catalogs established by Roger Romani et al. and Paolo Giommi et al. should be added to this list. For DC2, a sample of blazars with realistic positions will be used. Paolo has already provided Julie with a seed population from his catalogs, Roger is willing to do the same. The objective for DC2 is to test the identification procedure to the largest possible extent.

2. Gamma-ray statistical properties of the samples
The estimates by Dermer & Davis concerning the prediction of populations as seen by GLAST will be revisited/updated by Chuck and Roger et al. At least two radio galaxies are likely to be detected, CenA and M87, the prospects for detecting radio-quiet galaxies being dim.
In DC2 the LogN-LogS function, redshift distributions... will be established for the sample of identified blazars..

3. General properties of GLAST-detected blazars
A uniform definition of variability should be used throughout the collaboration and should consequently be devised in coordination with the other Science groups. It appears that at the momemt tools associated with variability studies are not part of the standard analysis environment and should be developed before DC2.
Properties like spectral index and cutoff, luminosity and spectral variability,duty cycle... should be determined for all identified blazars in DC2.

4. Specific Properties of Individual Sources

The more enlightening studies will be performed in association with Multi-wavelength campaigns. However, most data will be taken without simultaneous MW observations and non-simultaneous SEDs should be established too (Paolo Giommi has a software to compile SEDs with a large set of existing data).

Besides SED and timing properties, the correlation between gamma-ray emission and the structure of the jet established from VLBI observations will be highly instructive.

What sources should have the highest priority in MW campaigns? We will start out with outstanding sources, but the selection must be refined as the mission proceeds.

Different possibilities exist concerning routine radio and optical monitoring of GLAST-blazars. Observation of sources in non-flaring states is also important, offering in some cases a unique possibility of measuring the redshift.

A sample of bright sources will be investigated in details for DC2.

5. Extragalactic Background Light

Although it has been extensively studied in the context of extreme blazars, no consensus concerning the amount of attenuation caused by EBL has emerged in the community. The challenge being to disentangle the EBL attenuation from intrinsic effects (Klein-Nishina, intrinsic absorption...), different methods have been proposed (statistical studies, MW study on well-selected, high-redshift sources...) and the analysis strategy is still to be defined.

It will be very hard to extract any sensible information using the DC2 data by lack of statistics, but a preliminary machinery should nevertheless be available and could be evaluated in post-DC2 studies with data simulated over longer periods. Jim's simulation package already allows for different EBL models to be input.

Light curve simulations

Gino Tosti has presented the software package developed at Perugia simulating "realistic" light curves, based on different models: a simple "red-noise" model, the inversion of a power-law power density spectrum, a shot noise model... The correlated variation of the spectral index is also modeled enabling the production of complex patterns in the flux vs index plan, comparable to those observed.