

Unbinned Likelihood Analysis of EGRET Observations

S. W. Digel (USRA/GSFC)

We present a newly-developed likelihood analysis method for EGRET data that defines the likelihood function without binning the photon data or averaging the instrumental response functions. The standard likelihood analysis applied to EGRET data requires the photons to be binned spatially and in energy, and the point-spread functions to be averaged over energy and inclination angle. The full-width half maximum of the point-spread function increases by about 40% from on-axis to 30° inclination, and depending on the binning in energy can vary by more than that across a single energy bin. The new unbinned method avoids the loss of information that binning and averaging cause and can properly analyze regions where EGRET viewing periods overlap and photons with different inclination angles would otherwise be combined in the same bin. In the poster, we describe the unbinned analysis method and compare its sensitivity with binned analysis for detecting point sources in EGRET data.