

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Correlation Analysis of Temporal Variation of Spectral Parameters of Prompt GRB Emission¹ SRIHARSHA POTHAPRAGADA, SARAH REYNOLDS, MIKHAIL MEDVEDEV, University of Kansas — Prompt emission from a gamma-ray burst (GRB) exhibits very rapid and complicated temporal and spectral evolution, which likely contains a lot of information about the GRB origin. Using the BATSE time-resolved spectral fit data, we performed a number of correlation tests for individual bursts and for the entire sample. We report on the strong correlations between the low-energy power law index, α , and the observed photon flux, F , in some GRBs. Since, however, the observed flux is a poor measure of the intrinsic flux (because of dust extinction, unknown distances, etc.), we calculate the normalized flux F_* assuming that the correlation of α and F is unique for all GRBs. We carefully examine statistical biases this technique may produce. We speculate that the observed $F - \alpha$ and $F_* - \alpha$ correlations support the predictions of an anisotropic jitter radiation theory from Weibel-generated magnetic fields.

¹This work is supported by DoE grant DE-FG02-04ER54790 and NASA grant NNG-04GM41G.

Mikhail Medvedev
University of Kansas

Date submitted: 22 Jul 2005

Electronic form version 1.4