

Fluence correlations across the BATSE gamma-ray burst energy channels for short and long bursts

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Gamma-ray bursts (GRBs) are currently divided into short ($T_{90} < 2$ s) and long ($T_{90} > 2$ s) bursts. Long bursts are believed to be related to the collapse of a massive star, while short bursts are believed to be related to the collision of two neutron stars or a neutron star and a black hole. Recently, there have been indications that a third class of GRBs exists, the so-called very short bursts ($T_{90} < 0.1$ s). The BATSE catalog provides fluence data for 1292 bursts over four energy channels: 20 – 50 keV, 50 – 100 keV, 100 – 300 keV, and $E > 300$ keV. In this study, the fluence two-point correlation function was calculated across the four energy channels for each of the three temporal groups; the purpose being to investigate whether the fluence correlations are distinct for long, short, and very short bursts. Our preliminary analysis indicates that the fluence correlations for long bursts are distinct from those for the short and very short bursts, while the fluence correlations for the short and very short bursts are similar.