**Abstract**

Gamma Ray Bursts (GRBs) are the most luminous explosions to occur in the Universe. These electromagnetic explosions produce jets in a short burst of prompt emissions followed by an afterglow that also radiates across the electromagnetic spectrum. There are sharp increases of flux in the X-ray spectrum known as flares that occur in about 50% of afterglows. In this project, all of the afterglow emissions that were recorded by the Swift X-ray telescope (XRT), whether with flares or without, were fit using the Norris function (Norris et al. 2005) and power laws (Racusin et al. 2009). The Norris function and power laws fit the XRT data and also display the residual which is a crucial part of what is to be understood in the research, being the part which will give an idea of how good the fit is. The purpose of this research is to find a pattern within these flares and see if they look similar to the prompt emissions in hopes of characterizing them and alleviating some of the ambiguity of what causes them, as well as how these flares are produced.

**Example Afterglow Fits**

**Without Flares**

**With Flares**

**Conclusion & Future Work**

- Fit entire sample of ~1000 light curve data.
- Interesting flares that are both bright and isolated will be selected to characterize the residuals by collaborator, Jon Hakkila (University of Charleston), to further research in understanding these flares.
- Research from these flares will relate to shock physics and aid in a deeper understanding of relativistic shocks.

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