

Is Spectral Width a Reliable Measure of GRB Emission Physics?

J. Michael Burgess*

Max-Planck-Institut für extraterrestrische Physik

E-mail: jburgess@mpe.mpg.de

The spectral width and sharpness of unfolded, observed GRB spectra have been presented as a new tool to infer physical properties about GRB emission via spectral fitting of empirical models. Following the tradition of the “line-of-death”, the spectral width has been used to rule out synchrotron emission in a majority of GRBs. This claim is investigated via examination of both cataloged GRB spectra as well as reanalyzed spectra leading to the introduction of another empirical characterization of the spectra: the data width. This new auxiliary quantity is a direct measure of the folded data’s width. Examination of the distribution of data widths suggests that a large fraction of GRBs can be consistent with synchrotron emission. To assess this prediction, a sample of peak-flux GRB spectra are fit with an idealized, physical synchrotron model. It is found that many spectra can be adequately fit by this model even when the width measures would reject it. Thus, the results advocate for fitting a physical model to be the sole tool for testing that model.

*7th Fermi Symposium 2017
15-20 October 2017
Garmisch-Partenkirchen, Germany*

*Speaker.