Contribution ID: **31** Type: **Oral Presentation**

Spectral analysis of Fermi-LAT Gamma-ray bursts with known redshift and their potential use as cosmological standard candles

Tuesday, 4 July 2017 11:10 (20 minutes)

Long duration Gamma-Ray Bursts (GRBs) may serve as new standard candles to constrain cosmological parameters by probing the Hubble diagram well beyond the range of redshift currently accessible using type-Ia supernovae. The standardization of GRBs is based on relations which correlate two or more parameters, found from gamma-ray spectral modelling of which one is strongly dependent on the cosmological model. Amati et al. (2002) relation in particular is between the source rest frame energy (Ei,p) at which the prompt gamma-ray spectral energy distribution peaks and the isotropic-equivalent bolometric energy (Eiso). We built a sample of 25 long GRBs (LGRBs) with known redshift, which have been detected by the Fermi GBM and LAT instruments in eight years of operations (2008 - 2016). We derive Ei,p and Eiso for these LGRBs using the GBM and LAT data in joint spectral fits, often requiring multiple components, thus extending the computation of Eiso to the GeV range. Our results show that LGRBs detected by Fermi-LAT with significant GeV emission are consistent with the Amati relation and further enhance the possible use of GRBs as cosmological standard candles.

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

PhD

Main supervisor (name and email)
and his / her institution

Prof. Soebur Razzaque
University of Johannesburg

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

Primary author: Mr DIRIRSA, Feraol F. (University of Johannesburg)

Co-authors: Prof. PIRON, Frédéric (Université de Montpellier); Prof. RAZZAQUE, Soebur (University of Johannesburg)

Presenter: Mr DIRIRSA, Feraol F. (University of Johannesburg)

Session Classification: Astrophysics

Track Classification: Track D1 - Astrophysics