

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

For contribution SAIP (ID: 31, Track D1-Astrophysics)

May 30, 2018

Response from the Referee comments received on 15 May 2018:

A couple of key things to point out:

- Fig 1. is placed badly in the middle of a sentence.
- indicate if Pass 8 data was used
- Table 1: the symbols don't match the columns (there's α and γ for the same column, a E_p and E_0 for the same column, kT and α_1 aren't discussed in the note.
- The text says the best fits are found by minimizing the χ^2 , but then says the fits are found for χ^2 equal to unity. It's not clear how exactly the fits are done. This should be explained better.

We are thankful for your review of the manuscript and for your valuable comments that helped us to improve our paper. We append our responses according to comments. Sentences of your report are copied in black faces.

1. Fig 1. is placed badly in the middle of a sentence.
 - We have now relocated Fig.1 at the end of Section 1
2. indicate if Pass 8 data was used
 - Yes, we have used pass 8 data. We have rephrased the sentence in section 2, paragraph 2 and line 14-16 as:
For the LAT analysis, we have used the pass-8 data with Transient class events (Transient20E) by selecting them from within a 10-degrees radius of interest.
3. Table 1: the symbols don't match the columns (there's α and γ for the same column, a E_p and E_0 for the same column, kT and α_1 aren't discussed in the note.
 - In order to save space, we placed two symbols (parameters) in the same column. Since each GRB is modeled with one best-fit model for that GRB, only one of the symbols apply for that GRB. For example, α and E_p or γ and E_p and so on. We have now added an "or" between the symbols so that both cannot apply at the same time.
 - We have now added description of kT and α_1 in the last line of the paragraph just above Table 1.
4. The text says the best fits are found by minimizing the χ^2 , but then says the fits are found for χ^2 equal to unity. It's not clear how exactly the fits are done. This should be explained better (Section 3, paragraph 2, line 9).
 - To clarify, we have rephrased as:
The optimal parameters (k , m and σ_{ext}) can be obtained by minimizing the chi-square function ... , where N is the number of GRBs, such that the reduced $\chi^2 = 1$ [20].
In principle, one can obtain very low value of the χ^2 by increasing the parameter σ_{ext} but by setting the reduced $\chi^2 = 1$, one obtains a measure of the extrinsic unknown quantity σ_{ext} . This is a prescription given in ref. [20]. The other two parameters k and m which are in the Amati relation are not affected in this method.

5. Equation one is corrected (E_{iso} and $E_{i,p}$ are swapped)
6. In section 2, table 2, we made a correction for the computation of E_{iso}^{+} and E_{iso}^{++} for GRBs modeled only by SBPL. In our previous computation, on the side of the SBPL function we used \log in terms of using \log_{10} . So, through our paper, we made a relevant modification which related to these values, but it would not change the interpretation and deduction of our analysis.
7. The mistakes related to the English style were corrected.