



Catalog of isolated emission episodes in Gamma-ray bursts from Fermi, Swift and BATSE

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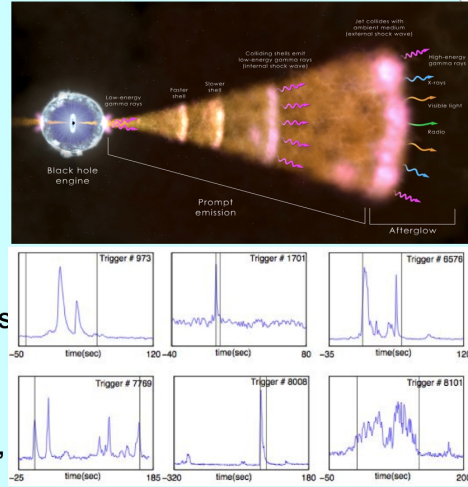
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Motivation

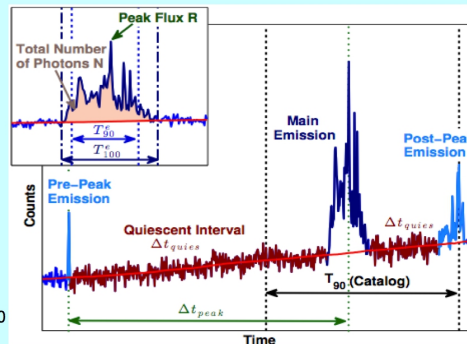
Gamma-ray bursts (GRBs) show complex temporal profiles. In several cases, the emission episodes are separated by intervals during which the flux falls to background level.

1. How are they produced? (temporary halt in activity of central engine, continuous central engine with varying output, different mechanism)
2. Are precursors (weak emission episodes before the main event) distinct from main event?
3. When should we search for non-electromagnetic signatures (e.g. neutrinos, gravitational waves)?



Data Analysis

We analyzed a comprehensive sample of long GRBs from the three main catalogs (Fermi, Swift and BATSE). We performed a completely automated Statistical analysis based on gravitational wave detection techniques. We searched for emission in a wide interval outside of the nominal duration T_{90}

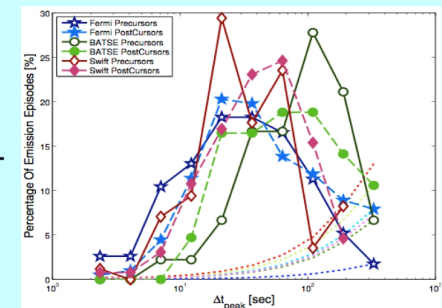
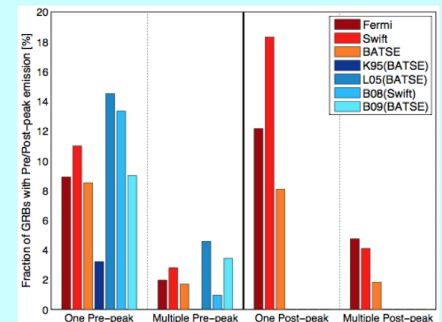


References

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Results

- We present the largest catalog of isolated emission episodes. Our data/results are available online <http://geco.markalab.org/GRBprecursors>
- A significant percentage of GRBs (>10%) show emission episodes before the main event, consistent with previous searches for precursors and a slightly higher (>15%) show emission after the main event.
- The temporal properties (duration, peak flux, number of photons) of pre/post peak emission are not correlated with the properties of the main event.
- The statistical properties of pre/post peak and main emission are statistically similar, possibly indicating common origin.
- Isolated emission episodes are separated by the main event with long quiescent intervals that extend to several hundreds of seconds.



Acknowledgments

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