GRB PRECURSOR TAGGING IN FERMI-GBM DATA

Paul Coppin*,
Krijn D. de Vries & Nick van Eijndhoven

*paulcppn@gmail.com
Vrije Universiteit Brussel, Dienst ELEM, Brussels, Belgium

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GRB PRECURSORS

- Dim gamma-ray flash preceding the main outburst
- Physical mechanism(s) still under debate
- Goal: Construct catalog of precursors and examine their properties

ANALYSIS

- Automated background characterisation
- Bayesian block light curves

- **2684 GRBs analyzed**
- Time window: $[-1000 \text{ s}, \ 1000 \text{ s}]$

RESULTS

1. $\sim$**1% of short GRBs** followed by precursor
2. $\sim$**10% of long GRBs** followed by precursor
   Increases to $\sim$16% if only 'sufficiently bright' bursts are included
3. **Quiescent time reveals bimodal distribution**
   $\Rightarrow$ May indicate two different physical mechanisms
4. Follow-up analysis by IceCube has been performed
   $\Rightarrow$ See contribution #469
5. Catalog and light curves: https://icecube.wisc.edu/~grbweb_public/Precursors.html

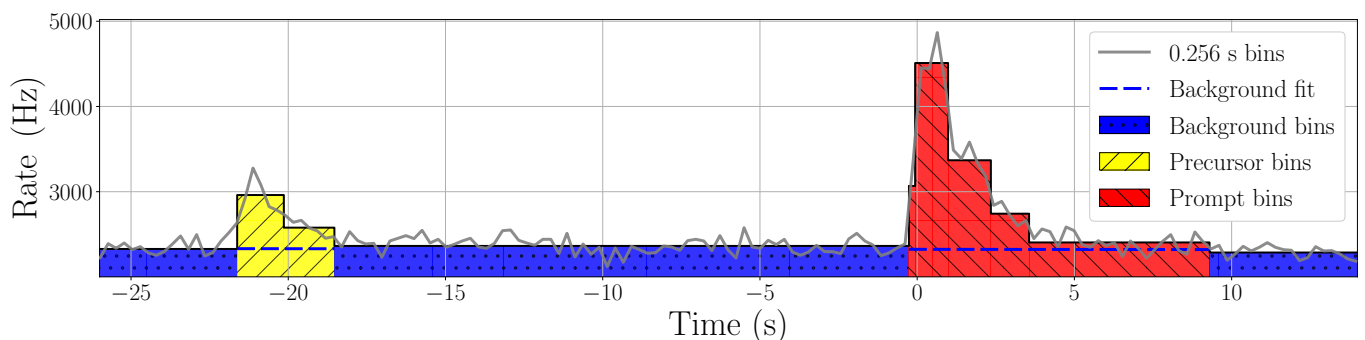Full results published in 10.1103/PhysRevD.102.103014

Figure 1: Light curve of GRB 'bn120308588', in which a single precursor was identified.