

Gamma-ray burst observation & gravitational wave event follow-up with CALET on the International Space Station

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on behalf of the CALET collaboration

CALorimetric Electron Telescope (CALET) is a payload on the International Space Station (ISS) to observe cosmic rays and gamma-rays. The Calorimeter (CAL) and CALET Gamma-ray Burst Monitor (CGBM) have been collecting gamma-ray and X-ray data in 1 GeV~10 TeV and 7 keV ~ 20 MeV, respectively. By the end of May 31, CGBM has detected 254 Gamma-Ray Bursts (GRB) thanks to the onboard trigger system, which calculates the signal-to-noise ratio and detects signals. Also, high-energy gamma-ray searches using CAL in 1 GeV~ 10 GeV energy range were performed for 99 GRBs, and we found two possible gamma-ray events from GRB 180526A and GRB 200101A. CALET has participated in the follow-up of EM counterparts of GW events. 56 events and one subthreshold event were reported by the LIGO/Virgo collaboration (LVC) and *Fermi*-GBM team in the LIGO/Virgo third observation run. Although no CGBM onboard trigger occurred around the trigger time of GW events, we searched for EM counterparts in CALET and CGBM data for the trigger time +/- 60 s. As a result, no candidate of EM counterparts was found in CALET data. We obtained upper limits of high energy gamma-ray flux for 26 events of that summed LIGO/Virgo localization probabilities are 5 % or greater.

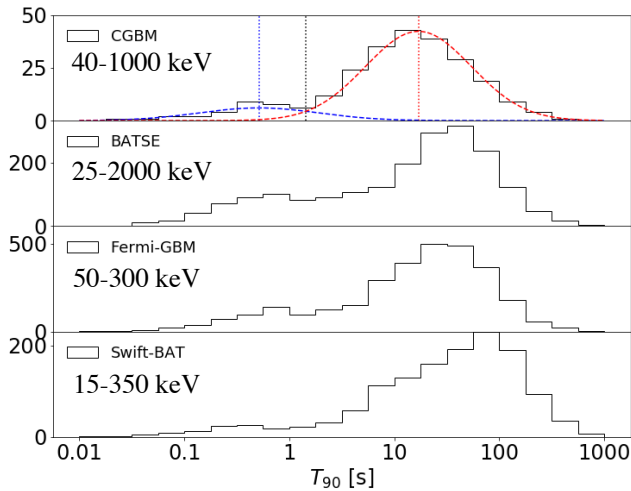


Figure 1. T_{90} distribution of CGBM GRBs. Distributions by other instruments are also shown. The CGBM distribution was well fitted by two logarithmic normal distributions. The mean of the two distributions are 0.51 s (blue dotted line) and 16.98 s (red dotted line). The intersection of the two distributions is 1.44 s.

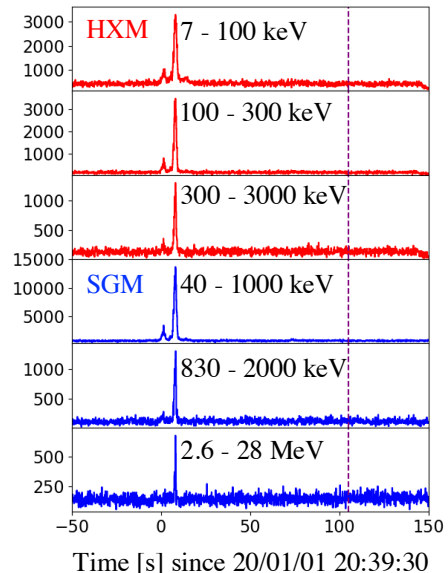


Figure 2. CGBM Light curves of GRB 200101A. A purple dotted line shows the arrival time of the possible high-energy gamma-ray event from GRB 200101A.