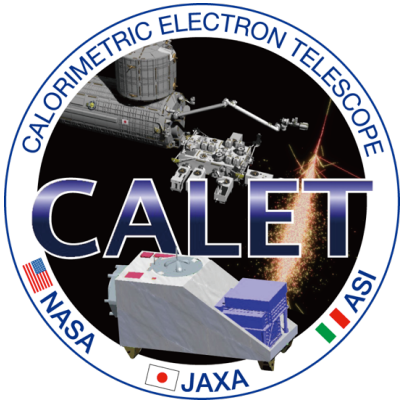
Gamma-ray burst observation & gravitational wave event follow-up with CALET on the International Space Station



Yuta Kawakubo (LSU)

on behalf of the CALET collaboration

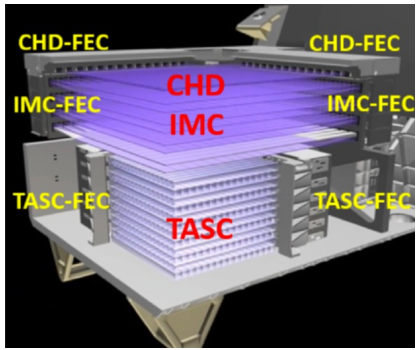
CALorimetric Electron Telescope (CALET)

Calorimeter (CAL)

Electrons: 1 GeV – 20 TeV

Gamma-rays: 1 GeV – 10 TeV

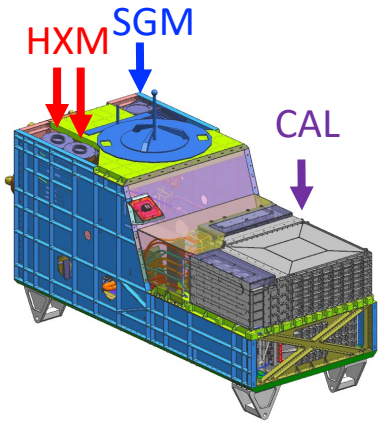
Protons & nuclei : 100 GeV - 1 PeV

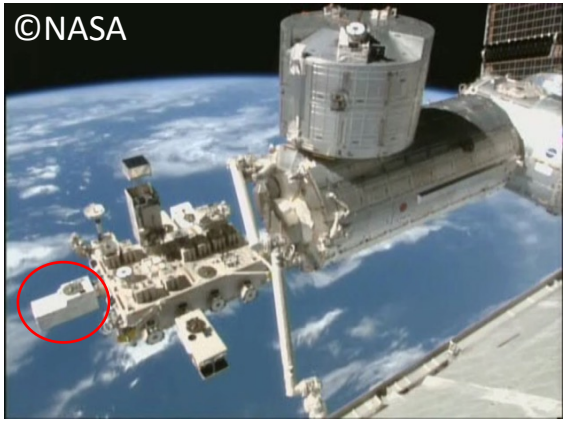


CHD
- Charge measurement

IMC
- Direction measurement
- Particle identification

TASC
- Energy measurement
- Particle identification

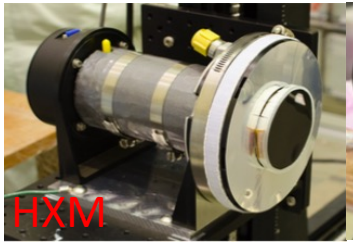


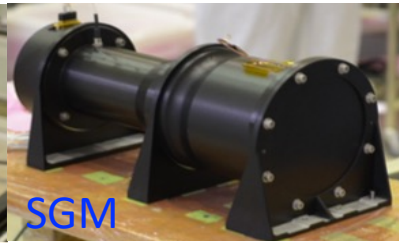


Gamma-ray Burst Monitor (CGBM)

Hard X-ray monitor (HXM) 7 keV - 1 MeV

Soft gamma-ray monitor (SGM) 40 keV - 20MeV

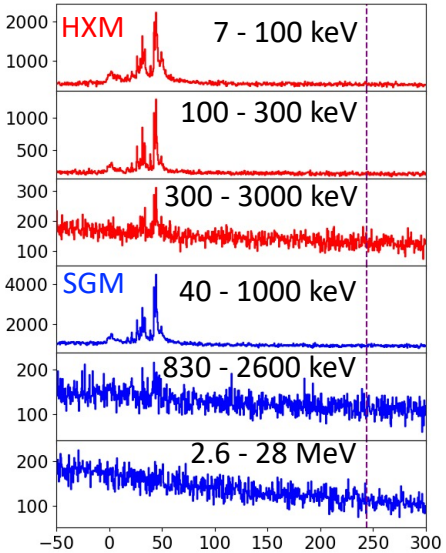




CALET has been observing cosmic rays and gamma-rays with stable operations on the International Space Station since October 2015.

Gamma-ray burst observation with CGBM

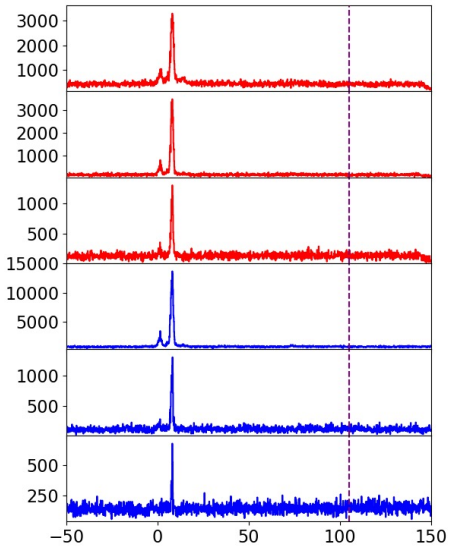
GRB 180526A



Time [s] since T_0

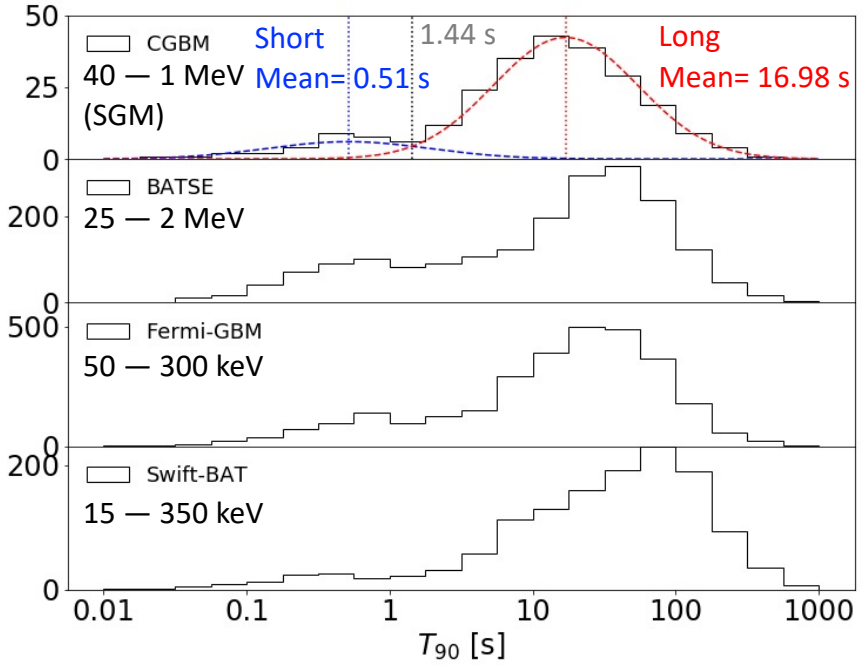
T_0 = 2018/05/26 11:03:36

GRB 200101A



Time [s] since T_0

T_0 = 2020/01/01 20:39:30

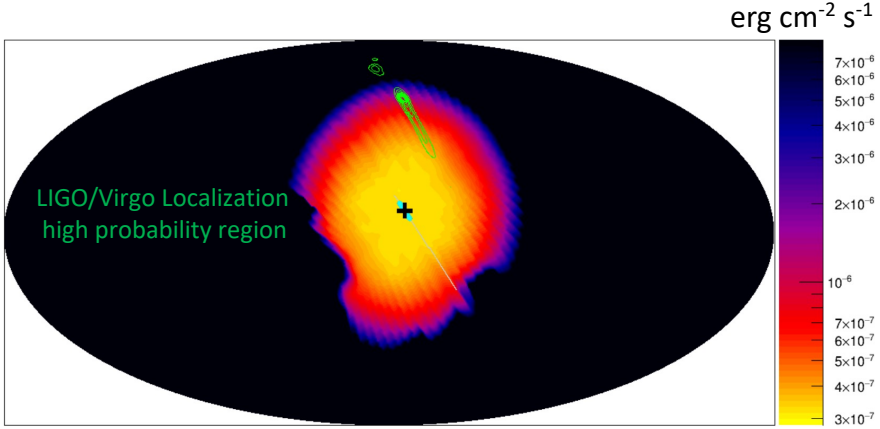


CGBM is collecting X-ray and gamma-ray data with a ~60 % duty cycle. CGBM detected 254 gamma-ray bursts (GRBs), 223 long and 31 short bursts, by the end of May 2021.

Search for EM counterparts of GW in O3

CALET searched for electromagnetic (EM) counterparts of gravitational wave (GW) events in the LIGO/Virgo third observation run (O3).

Although no candidate was found in CALET data, we derived upper limits of high-energy gamma-ray flux for 26 GW events in O3.



Gamma-ray flux upper limit map for S190408an (1-10 GeV)

Contents in the poster

- GRB observation with CGBM
- CAL high-energy gamma-ray search from GRBs detected by CGBM
- Search for electromagnetic (EM) counterparts of gravitational wave (GW) events in the LIGO/Virgo third observation run (O3).

Other gamma-ray presentations

- *High-energy gamma-ray observations above 10 GeV with CALET on the International Space Station* by Masaki Mori
- *Low-energy gamma-ray observations above 1 GeV with CALET on the International Space Station*, by Nick Cannady