



Contribution ID: 106

Type: not specified

Gamma-Ray Burst observations by HEPD-01 space detector on board CSES-01 as an anticipation of future ones by HEPD-02 on CSES-02

Tuesday, 12 September 2023 15:45 (15 minutes)

Gamma-Ray Bursts (GRBs) are among the brightest and most energetic events in the Universe, in the form of violent extragalactic explosions of gamma rays, which are detected at the top of the Earth's atmosphere by high-energy photon detectors. Although not specifically designed for gamma-ray detection, the High-Energy Particle Detector (HEPD-01), operational since 2018 on a low-Earth orbit, clearly detected five strong events, namely GRB190114C, GRB190305A, GRB190928A, GRB200826B and GRB211211A, between 2019 and 2021. For each event, HEPD-01 electron-flux time profiles closely match the time evolution of GRB photons detected by dedicated gamma-ray instruments like PICsIT and SPI-ACS on board the INTEGRAL satellite. The origin of these electron-triggered signals in HEPD-01 has been investigated through a Monte Carlo simulation, and it has been found out to be the result of low-energy electrons produced in the interaction of high-energy GRB photons with passive and active structures of the detector itself. The GRB observation by HEPD-01 presented here is valuable *per se*, as an independent source of data, given the 5-yr uninterrupted observation, and in view of the forthcoming launch of HEPD-02 on board the CSES-02 satellite. In actual fact, unlike HEPD-01, the second-generation detector will be equipped with a dedicated trigger system for gamma-ray detection, which is likely to allow the future mission to contribute to a wider, real-time GRB alert program.

Primary author: Dr PALMA, Francesco (Istituto Nazionale di Fisica Nucleare)

Presenter: Dr PALMA, Francesco (Istituto Nazionale di Fisica Nucleare)

Session Classification: GRA: Gamma Ray Astronomy

Track Classification: Gamma Ray Astronomy