

The HEPD-02 trigger and PMT readout system for the CSES-02 mission

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This contribution describes the Trigger board of the High-Energy Particle Detector, which will be placed onboard the second China Seismo-Electromagnetic Satellite for CSES-Limadou mission.

This mission will monitor variations in ionospheric parameters that are supposed to be related to earthquakes.

The first satellite is already in orbit and the second one will be launched in 2023.

The HEPD detector will be composed by a tracker made of CMOS sensors (ALPIDE sensors), followed by two segmented planes of plastic scintillators used for trigger signals generation.

The actual calorimeter will be composed by twelve planes of plastic scintillator and two segmented planes of an inorganic scintillator called LYSO. The calorimeter is surrounded by five scintillator planes used as a veto system.

All the scintillators are coupled with PMTs, whose signals are acquired and digitized by the Trigger board, that also implements the trigger system for the whole apparatus.

The ongoing work on the Trigger board consists in the design of both the hardware and the firmware used for the communication with the other boards of the detector, power managing, and the interfacing with the ASIC used for PMTs' readout.

Eventually the Trigger board will be tested to verify its functionalities and its compliance with the HEPD design specifications. Next developments are the integration of the Trigger board with the other systems on the detector and the environmental testing of the whole system.

Keywords

electronics; High-Energy Particle Detector; satellite; earthquakes; calorimeter; trigger system; CSES; Limadou; Low earth orbit satellites; Space detectors

Collaboration

other (fill field below)

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Subcategory

Experimental Methods & Instrumentation

Primary authors: Dr MESE, Marco (Università degli Studi di Napoli Federico II); Mr ANASTASIO, Antonio (Istituto Nazionale di Fisica Nucleare Sezione di Napoli); Dr CAMPANA, Donatella (Istituto Nazionale di Fisica Nucleare Sezione di Napoli); Mr MASONE, Vincenzo (Istituto Nazionale di Fisica Nucleare Sezione di Napoli); Dr OSTERIA, Giuseppe (Istituto Nazionale di Fisica Nucleare Sezione di Napoli); Dr PERFETTO, Francesco (Istituto Nazionale di Fisica Nucleare Sezione di Napoli); Dr SCOTTI, Valentina (INFN Napoli and Università di Napoli "Federico II"); Mr VANZANELLA, Antonio (INFN - Napoli); FOR THE CSES-LIMADOU COLLABORATION

Presenter: Dr MESE, Marco (Università degli Studi di Napoli Federico II)

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