



Contribution ID: 19

Type: not specified

The HEPD detector on board CSES satellite: in-flight performance

Friday, 22 June 2018 10:55 (20 minutes)

CSES (China Seismo-Electromagnetic Satellite) is a scientific mission dedicated to monitoring electromagnetic field, plasma and particles perturbations of atmosphere and inner Van Allen belts caused by solar and terrestrial phenomena and to the study of the low energy component of the cosmic rays.

The satellite hosts several instruments onboard: two magnetometers, an electrical field detector, a plasma analyser, a Langmuir probe and two particle detectors. It has been successfully launched from the Jiuquan Satellite Launch Center located in west of inner Mongolia on February 2 2018 and is now orbiting in nominal condition.

The high energy particle detector (HEPD), designed and built by the Italian “Limadou” collaboration, aims at investigating precipitation of trapped particles induced by atmospheric EM emissions, as well as by the seismo-electromagnetic disturbances.

HEPD provides good energy resolution and high angular resolution for electrons (3-100 MeV) and proton (30-200 MeV). The instrument consists of: 2 planes of double-side silicon microstrip sensors placed on the top of the instrument (direction of particle); 2 two layers of plastic scintillators (trigger) and a calorimeter (constituted by other 16 scintillators and a layer of LYSO sensors). A scintillator veto system completes the instrument.

The commissioning of the HEPD and the other instruments on board is in progress and will last several months. In this contribution we will describe the HEPD detector and the (preliminary) performance in flight.

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Session Classification: Instrumentation for Astroparticle Experiments