

Contribution ID: 73

Type: **not specified**

HERD highlights

Tuesday, 5 July 2016 16:50 (30 minutes)

The High Energy cosmic-Radiation Detection (HERD) facility is one of several space astronomy payloads of the cosmic lighthouse program onboard China's Space Station, which is planned for operation starting around 2022 for about 10 years. The main scientific objectives of HERD are indirect dark matter search, precise cosmic ray spectrum and composition measurements up to the knee energy, and high energy gamma-ray monitoring and survey. In order to achieve high statistic measurement, HERD has an effective geometrical factors of >3 m²sr for electron and diffuse gamma-rays, >2 m²sr for cosmic ray nuclei.

The detector is composed of a 3-D cubic calorimeter (CALO) surrounded by microstrip silicon trackers (STK) from five sides. CALO is made of about 104 cubes of LYSO crystals, corresponding to about 55 radiation lengths and 3 nuclear interaction lengths, respectively. The top STK microstrips of seven X-Y layers are sandwiched with tungsten converters to make precise directional measurements of incoming electrons and gamma-rays. In the baseline design, each of the four side SKTs is made of only three layers microstrips. All STKs will also be used for measuring the charge and incoming directions of cosmic rays, as well as identifying back scattered tracks. With the current design, HERD can achieve the following performance: energy resolution of 1% for electrons and gamma-rays beyond 100 GeV, 20% for protons from 100 GeV to 1 PeV; an electron/proton separation power better than 10⁻⁵. The main goal of the mission, the physics performance as well as the current R&D activities on both CALO and STK will be described.

Primary author: AMBROSI, Giovanni (PG)

Presenter: AMBROSI, Giovanni (PG)

Session Classification: Cosmic Rays Direct Measurements