Contribution ID: **67** Type: **Oral**

Current Status of the HERD Space Project

Tuesday 13 May 2025 09:25 (25 minutes)

The High Energy cosmic-Radiation Detection facility (HERD) is an international space-borne experiment set to be installed on the China Space Station (CSS). HERD will address several major problems in fundamental physics and astrophysics, including cosmic ray (CR) direct measurements up to PeV energies, dark matter searches, and a gamma-ray survey above 0.1 GeV. The current design of HERD comprises five sub-detectors. At its core is a 3D imaging calorimeter (CALO), which consists of 7,489 cubic LYSO crystals, each with an edge length of 3 cm, arranged in an octagonal prism shape. The CALO is read out by two independent systems: an image intensified CMOS (IsCMOS) camera and photodiodes (PD). On the top side of the CALO, a micro Silicon Strip Tracker (STK) is installed to determine the trajectory of incident particles. Surrounding the CALO, a five-sided Plastic Scintillator Detector (PSD) is employed for gamma-ray selection. The Silicon Charge Detector (SCD) provides precise measurements of the absolute charge of particles. Additionally, a transition radiation detector (TRD) is positioned on one of the lateral sides to provide accurate energy calibration. This report will discuss the current status of the HERD project and results from recent beam tests.

Eligibility for ”Best presentation for young researcher” or ”Best poster for young researcher” prize

No

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Session Classification: Instrumentation and missions for direct high-energy CR measurements