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Performance study on HERD sub-detectors: silicon charge detector (SCD) prototype

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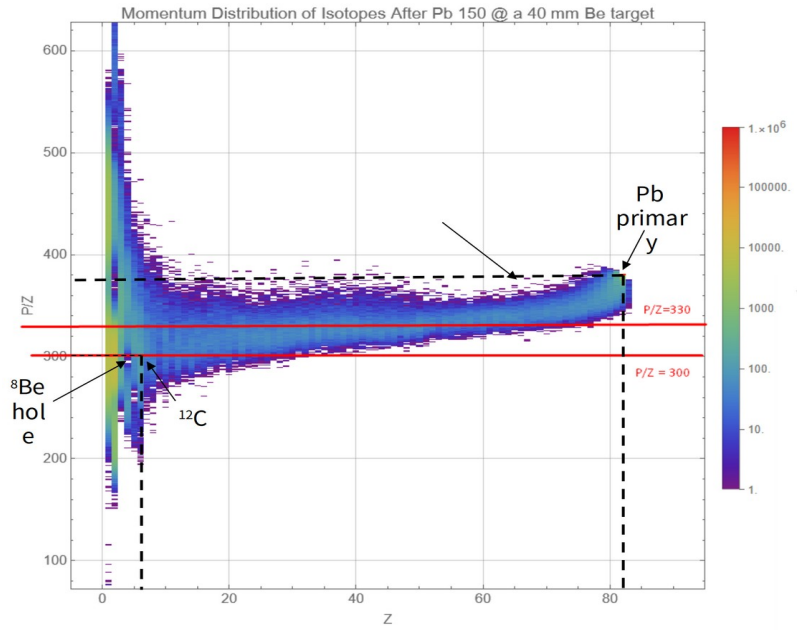
THE HIGH ENERGY COSMIC-RADIATION DETECTION (HERD) FACILITY

- The High Energy cosmic-Radiation Detection (HERD) facility is part of the Cosmic Lighthouse Program onboard China's Space Station.
- Its purpose is to directly measure high-energy electrons, gamma-rays, and in general all the cosmic ray nuclei.
- HERD is composed of five sub-detectors: an homogeneous, deep, 3D segmented calorimeter (CALO), a FIber Tracker (FIT), a Plastic Scintillation Detector (PSD), a Silicon Charge Detector (SCD), and a Transition Radiation Detector (TRD).



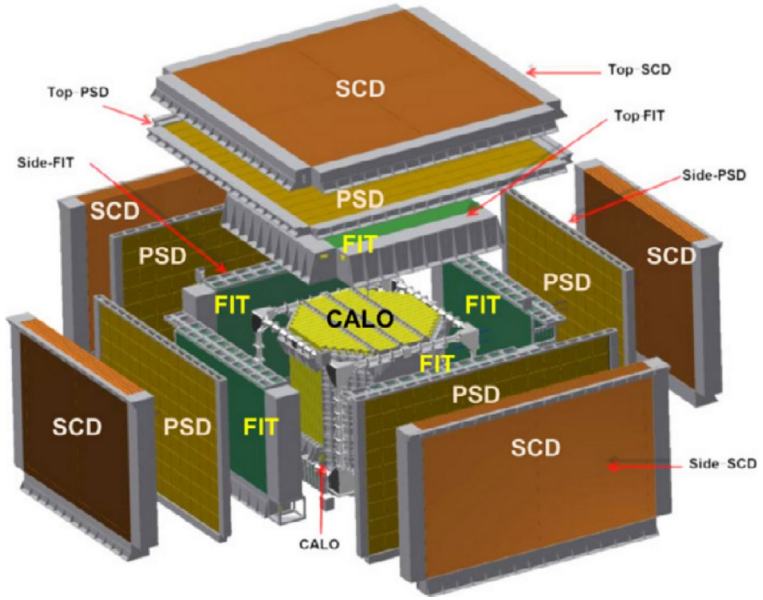


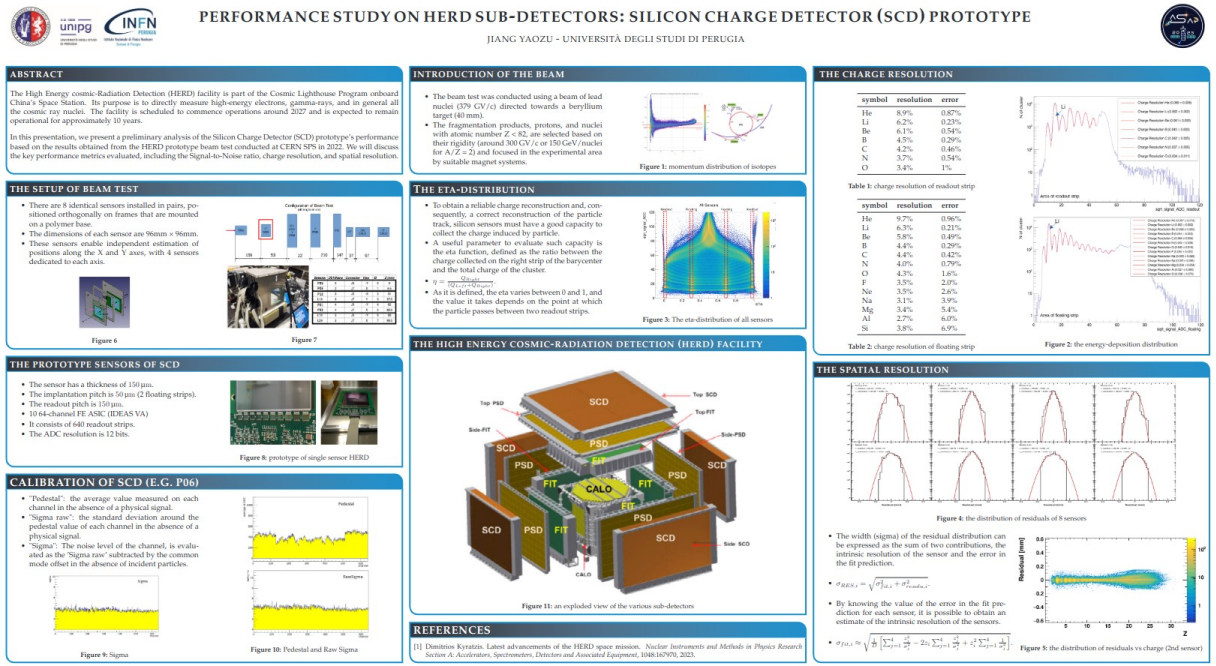
Figure 1: an exploded view of the various sub-detectors

INTRODUCTION OF THE BEAM

- The beam test was conducted using a beam of lead nuclei (379 GV/c) directed towards a beryllium target (40 mm).
- The fragmentation products, protons, and nuclei with atomic number $Z < 82$, are selected based on their rigidity (around 300 GV/c or 150 GeV/nuclei for $A/Z = 2$) and focused in the experimental area by suitable magnet systems.

The content of the poster

- The setup of beam test.
- The feature of the prototype sensors
- The calibration of SCD
- The eta-distribution
- The charge resolution
- The spatial resolution



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