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The High Energy Cosmic-Radiation Detection (HERD) facility for direct cosmic-ray measurements.

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The High Energy cosmic-Radiation Detection (HERD) facility is a future space experiment which is designed for the direct measurement of cosmic-rays (CR). The instrument will be installed aboard the China's Space Station around 2027 and is based on a homogeneous, deep, 3D segmented calorimeter. The calorimeter is surrounded by scintillating fiber trackers, anti-coincidence scintillators, silicon charge detectors, and a transition radiation detector. The HERD instrument is designed to feature a very large acceptance, of about one order of magnitude larger than previous experiments. Thanks to its innovative design, the HERD experiment will extend the measurements of cosmic rays and gamma-rays by about one order of magnitude in energy with respect to the current results. Fundamental progress in our understanding of propagation and acceleration of CR inside the Galaxy will be achieved by measuring the flux of protons and nuclei above hundreds of TeV per nucleon. By exploring the electron flux in the multi-TeV region, it will possible to search for the signature of dark matter and nearby astrophysical sources. Finally, thanks to the large field of view, the experiment will also monitor the gamma-ray sky from a few hundreds of MeV up to 1 TeV. In this contribution, a review of the current status of the experiment will be presented, with particular regards to the estimated detector performances and the expected physics result.

In-person participation

Yes

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