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Gamma-ray performance study of the HERD payload

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The High Energy cosmic-Radiation Detection (HERD) facility has been proposed as a space astronomy payload onboard the future China's Space Station. HERD is planned for operation starting around 2025 for about 10 years In addition to the unprecedented sensitivity for dark matter searches and cosmic-ray measurements up to the knee energy, it should perform gamma-ray monitoring and full sky survey from few hundred MeV up to tens of TeV. We present the first study of the HERD gamma-ray performance obtained with full simulations of the whole detector geometry. HERD will be a cubic detector composed with 5 active faces. We present a study conducted inside the HERD analysis software package, which includes a detailed description of the detector materials. The HERD effective area, the point spread function and the resulting gamma-ray sensitivity have been estimated for different detector configurations, in particular taking into account different detector sides and investigating also some design optimization possibilities like the addition of tungsten layers for enhancing the gamma-ray conversion probability.

Keywords

Gamma-ray, satellite, sensitivity, HERD, MC

Collaboration

other (fill field below)

other Collaboration

HERD

Subcategory

Future projects

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