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The High-Energy Particle Detector (HEPD-01): observations and results after 4 years in orbit

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The High-Energy Particle Detector (HEPD-01) onboard the China Seismo-Electromagnetic Satellite (CSES-01) - launched in February 2018 - is a light and compact payload suitable for measuring electrons (3-100 MeV), protons (30-300 MeV), and light nuclei (up to a few hundreds of MeV) with a high energy resolution and a wide angular acceptance. The very good capabilities in particle detection and separation, together with the Sun-synchronous orbit, make HEPD-01 well suited for the observation of the wide plethora of particle populations in Low-Earth Orbit. During its first 4 years of data-taking, the detector –completely designed and built in Italy –gathered results on galactic, solar and trapped particles with energies between tens and hundreds of MeVs, contributing to better understanding some aspects of particle transport inside the heliosphere, the mechanism of acceleration during Solar Particle Events and to obtain very good insights of particle behavior during various geomagnetic storms. The mission will continue taking data throughout the current solar cycle, serving as a very reliable and accurate tool for studying low-energy particles in near-Earth space.
In this contribution, we report some of the results obtained by HEPD-01, together with some information on the data-analysis techniques employed for this kind of studies.

Summary

Primary author: MARTUCCI, Matteo (Istituto Nazionale di Fisica Nucleare)

Presenter: MARTUCCI, Matteo (Istituto Nazionale di Fisica Nucleare)

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