

Development of a Penetrating particle ANalyzer for high-energy radiation measurements in space

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The Penetrating Particle Analyzer (PAN) is an instrument conceived to precisely measure the flux, composition and arrival direction of highly penetrating particles in space of energy ranging from 100 MeV/n to 20 GeV/n. Precise measurements of their energy spectra and composition are of great interest to study Solar Modulation of Cosmic Rays, to characterise SEPs, as well as the radiation environment around planets and to improve Space Weather predictions for Deep Space travels.

The design is based on a modular magnetic spectrometer of small size, reduced power consumption and weight which make it suitable for deep space and interplanetary missions. The high-field permanent magnet sectors are instrumented with high resolution silicon micro-strip detectors, Time-Of-Flight scintillator counters read-out by SiPMs, and active Pixel detectors to maintain the detection capabilities in high rate conditions occurring during solar energetic particle events (SEPs) or when traversing radiation belts around planets. After the description of the PAN instrument, the development and tests of the mini.PAN demonstrator will be presented in this contribution.

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