

The development of a demonstrator of the Penetrating Particle Analyzer for space missions

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The Penetrating particle Analyzer (PAN) is an instrument designed to operate in space to measure and monitor the flux, composition, and direction of highly penetrating particles in energy range from 100 MeV/n to 20 GeV/n. The demonstrator, called Mini.PAN, employs 2 sectors of permanent magnets arranged in Halbach geometry. These are interleaved with silicon strip detectors with 25 μm pitch in the bending direction. They are complimented by hybrid pixel detectors (HPD) allowing for high-rate measurements and a time-of-flight system made of scintillators. We present results of laboratory testing of the individual subdetectors and Mini.PAN as a whole. It was found that particle energy resolution of below 20 % can be achieved with Mini.PAN. We give an outlook at future development towards instrument simplification relying purely on latest generation HPD (Pix.PAN) and discuss possible application in deep space or orbits around the Moon, where such precise measurements have never been done.

Alternate track

1. Detectors for Future Facilities, R&D, Novel Techniques

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