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BeER: a multi-purpose, high-resolution, high dynamic-range charge detector well suited for cosmic ray measurements and various applications.

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We present Beam-monitor with Extreme Range (BeER), an innovative charge detector with high resolution and a wide dynamic range, initially designed to provide unique information on high-energy ion beams, which are commonly used in cosmic ray experiments for detector characterization. Several detector prototypes, built using Si photodiodes and custom readout electronics, have undergone extensive testing during beam tests at CERN-SPS and LNF-BTF (Frascati, Italy) facilities. Furthermore, BeER data has already been successfully used by the HERD and AMS-02 experiments. The detector features exceptional performance, enabling BeER to measure nuclei with atomic numbers ranging from 1 to 80 with a resolution better than 2.5 charge units. Here, we present the results from the prototype testing phase and discuss ongoing detector development and potential applications, including the direct measurement of cosmic rays in space, off-line and on-line beam monitoring, and cross-section measurements.

Eligibility for "Best presentation for young researcher" or "Best poster for young researcher" prize

No

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