

Radiation field decomposition using Compact Timepix2-based Tracker and AI for Accelerator Physics and Space

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In this study, high-energy Carbon-ion and proton beams produced in an accelerator were used. The Minipix Sprinter, a hybrid semiconductor pixel detector with novel operation and configuration customized for highly energetic particles was positioned in the primary beam for spectral and component characterization of individual particles. This detector has a demonstrated quantum-imaging sensitivity, enables real-time visualisation of particle tracks along with full spectral and tracking response.

Particles were sorted using a trained AI machine learning algorithm into: i) ions, ii) protons, iii) electrons and photons, and iv) thermal neutrons.

Results were processed for in-beam and mixed radiation fields from accelerators and space environment in terms of particle flux with particle type identification, dose rate, directional maps, and energy spectra. The outcomes provide complete beam characterization with particle identification, serving as valuable data for benchmarking MC codes.

Alternate track

1. Operation, Performance and Upgrade (incl. HL-LHC) of Present Detectors

I read the instructions above

Yes

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