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Performance assessment of profile monitors at CERN's LHC using systematic analysis tools

Thursday 5 June 2025 15:30 (2 hours)

In this paper, we investigate statistical and systematic tools to establish performance benchmarks for future beam profile measurement tools, using extensive data from both prototype and legacy Beam Wire Scanners and the Beam Synchrotron Radiation Telescope at the LHC. We detail direct and comparative analyses, including variability in beam size measurements, positioning accuracy, and profile shape fidelity relative to theoretical models, with particular focus on non-Gaussian tails influenced by the beam halo effect. This work establishes a foundation for systematic performance assessment applicable to both current and next-generation profile measurement tools.

Footnotes

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Europe

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