Contribution ID: **2151** Contribution code: **THPL080** Type: **Poster Presentation**

Review of CERN beam instrumentation for fixed target experiments

Thursday, 11 May 2023 16:30 (2 hours)

Measuring beam parameters in the vicinity of fixed target experiments or interceptive devices like beam dumps is essential to ensure efficient fixed target physics and safe beam operation. At the same time the beam diagnostic reach is very often challenging in terms of robustness and performance. This paper reviews the CERN instruments exploited to measure protons at different CERN fixed target facilities (ISOLDE, PS East Area, AD, SPS North Area, HIRADMAT) and beam dumps (SPS, LHC), focusing on recent developments/results, limitations and future plans. Emphasis will be given to beam size and beam position monitors systems and their response to high power and/or density proton beams at target locations, thus involving radiation hardness, background and power deposition issues. The discussion will also refer to new materials studies and modern machine learning techniques developed to enhance the monitors overall accuracy and reliability.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

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Session Classification: Thursday Poster Session

Track Classification: MC6: Beam Instrumentation, Controls, Feedback and Operational Aspects: MC6.T03: Beam Diagnostics and Instrumentation