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Preparing the future SPS fixed target beams for the SHiP experiment

Monday 2 June 2025 16:00 (2 hours)

A new high-intensity Beam Dump Facility (BDF), hosting the SHiP (Search of Hidden Particles) experiment, is set to begin operation in CERN's North Area (NA) in Run 4. To meet its physics goals, SHiP aims at accumulating 4×10^{19} protons on target per year, which will require approximately 10^6 high intensity cycles from the SPS with 4.2×10^{13} p^+ per cycle (as operationally used during the CNGS era) over a 1 s spill length. To reduce the future supercycle load and thus minimize the impact on the other physics facilities (especially at the CERN PS complex delivering the beam to the SPS), a strategy involving higher intensity per spill but a smaller number of spills for SHiP was proposed. In this context, a series of studies have been initiated to explore the intensity limits of the North Area beams in the SPS. This contribution presents the initial results on the correction of the intensity dependent tune shift induced by the beam coupling impedance and the transverse optimizations required for operating at higher intensities.

Footnotes

Paper preparation format

Region represented

Europe

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