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Design of a new CERN SPS injection system via numerical optimisation

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The Super Proton Synchrotron (SPS) injection system plays a fundamental role to preserve the quality of injected high-brightness beams for the Large Hadron Collider (LHC) physics program and to maintain the maximum storable intensity. The present system is the result of years of upgrades and patches of a system not conceived for such intensities and beam qualities. In this study, we propose the design of a completely new injection system for the SPS using multi-level numerical optimisation, including realistic hardware assumptions. We also present how this hierarchical optimisation framework can be adapted to other situations for optimal accelerator system design.

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Footnotes

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Yes

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