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Resonance compensation at the CERN PS booster aided by Bayesian optimization and BOBYQA

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The CERN Proton Synchrotron Booster (PSB) operation involves the crossing of multiple resonance lines in the tune diagram. Loss maps from dynamic tune scans are a helpful way to visualize and quantify the strength of such resonances. Sextupole and octupole correctors can be used in order to partially or fully compensate multiple resonance lines, i.e., third and fourth order lines. The following work explores the application of advanced optimization algorithms such as Bayesian Optimization and Bound Optimization By Quadratic Approximation (BOBYQA) in order to compensate these resonance lines with available correctors.

Footnotes

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Region represented

North America

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