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Proton beam dynamics in bare IOTA with intense space-charge

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We are currently commissioning the Integrable Optics Test Accelerator at Fermilab to conduct beam dynamics experiments with 2.5 MeV protons, for transverse space-charge tune shifts approaching 0.5. In this study, we assess the anticipated emittance growth and beam loss as intensity varies, considering configurations where only the dipoles and quadrupoles are activated. Our analysis involves a comparison of results obtained from various simulation codes, including XSuite, PyORBIT, IMPACT-X, and MAD-X.

Footnotes

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