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Optical properties of wigglers with high field-to-energy ratio

Tuesday 12 August 2025 16:00 (2 hours)

One of the options to bring electron cooling to high energies is to employ an electron storage ring, which utilizes damping wigglers to counteract emittance growth of electron bunches used to cool hadrons. An example of such a cooler is the Ring Electron Cooler (REC) that can find potential future applications in Electron Ion Collider. The REC is designed to operate at 150 MeV and requires wigglers with peak field of 2.4 T. This unique combination a strong field wiggler operated at a relatively low energy results in unusual optical properties. In this paper we derive analytic formulas for focusing and chromaticity of different wiggler options and compare analytic and beam tracking results. While our analysis was used to optimize chromaticity in the REC, the derived formulas have a general applicability to wigglers with a high field-to-energy ratio.

Please consider my poster for contributed oral presentation

Yes

Would you like to submit this poster in student poster session on Sunday (August 10th)

No

Footnotes

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Yes

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