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Analytic and numerical calculation of collider luminosity with CRAB dynamics

Wednesday, 10 May 2023 16:30 (2 hours)

For an integral part of electron-ion collider (EIC) de-sign, the crab crossing scheme provides a head-on collision for beams with a nonzero crossing angle. Recently we provided a framework for accurate numerical simulations of beam-beam effects with crabbing crossing dynamics. The framework was implemented in a simulation code package named "CASA BeamBeam". We offer com-prehensive formulas for calculation of collider luminosity for various cases in the code package. The luminosity calculation module of CASA Beam-Beam now includes the hourglass effect, the beam-tilt effects and the beam offset effect. The benchmarking results show good agreement between the numerical calculation and analyt-ic solution.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

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