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Lattice correction and polarization estimation for the future circular collider e+e-

Monday 2 June 2025 16:00 (2 hours)

Precise determination of the center-of-mass energy at the Future Circular Collider (FCC-ee) operating at the Z and W resonance energies relies on resonant spin depolarization techniques, which require a sufficient level of transverse beam polarization in the presence of machine imperfections. In this study, the FCC-ee lattice is modeled and simulated under a range of realistic imperfections, complemented by refined orbit correction and tune-matching procedures. The equilibrium polarization is computed within these realistic machine models to investigate the causes of polarization loss and explore potential improvements through lattice optimization. Additionally, spin tune shifts, which contribute to systematic errors, are estimated to support the precision requirements of the energy calibration experiment.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

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