

eeFACT 2025 - 70th ICFA Advanced Beam Dynamics Workshop on High Luminosity Circular e⁺e⁻ Colliders



Contribution ID: 51

Type: **Invited Oral Presentation**

Spin Polarization Simulations for the FCC-ee

Thursday 6 March 2025 10:00 (30 minutes)

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

Funding Agency

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Yes

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Session Classification: Polarization, Energy calibration, Monochromatization

Track Classification: WG8 : Polarization, Energy calibration, Monochromatization