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Beam Polarization studies: status and challenges

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High-precision center-of-mass energy calibration at the Future Circular Collider e^+e^- (FCC-ee) relies on sufficient transverse beam polarization for resonant depolarization measurements. Simulations have been performed to assess the achievable polarization levels in the presence of machine imperfections. Harmonic spin matching techniques have been explored to enhance polarization. The impact of imperfections on closed orbit spin tune shifts has been analyzed, revealing the contribution to systematic uncertainties that affect the precision of energy measurements. Preliminary studies on resonant depolarization have also been carried out.

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