

Self polarization in the collider

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The use of resonant depolarization has been suggested for precise beam energy measurements in the FCC-ee for Z and WW physics at 90 and 160 GeV CM energy respectively. In addition longitudinal beam polarization would benefit the Z peak physics program.

The large time constant of self-polarization (Sokolov-Ternov effect) in such a large ring can be greatly reduced by inserting proper wigglers in the machine lattice. The resulting large beam energy spread however may destroy polarization in presence of unavoidable magnet misalignments. This calls for precise machine alignment and careful orbit correction.

In this paper the possibility of self-polarization in the FCC-ee at 45 and 80 GeV beam energy in presence of wigglers is investigated. Simulations with quadrupole misalignment and orbit correction are presented.

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