

Optimization of spin-coherence time in a prototype storage ring for electric dipole moment measurements

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Abstract

The JEDI experiment is devoted to the search for the electric dipole moment (EDM) of charged particles in a storage ring, as a very sensitive probe of physics beyond the Standard Model. In order to reach the highest possible sensitivity, a fundamental parameter to be optimized is the particles' Spin Coherence Time (SCT), i.e., the time interval within which the particles of the stored beam maintain a net polarization greater than $1/e$. To identify the working conditions that maximize SCT, accurate spin-dynamics simulations with the code BMAD have been performed on the lattice of a "prototype" storage ring which uses a combination of electric and magnetic fields for bending. The talk will present the results of these simulations addressing the impact on the SCT of different factors like horizontal tune, synchrotron tune and effect of the electric bending components.