

# Simulation and Optimization of the Spin Coherence Time of Protons in a Prototype EDM Ring

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The matter-antimatter asymmetry might be understood by investigating the EDM (Electric Dipole Moment) of elementary charged particles. A permanent EDM of a subatomic particle violates time reversal and parity symmetry at the same time and would be, with the currently achievable experimental accuracy, a strong indication for physics beyond the Standard Model.

The JEDI-Collaboration (Jülich Electric Dipole moment Investigations) in Jülich is preparing a direct EDM measurement for protons and deuterons: first at the storage ring COSY (COoler SYnchrotron) and later at a dedicated storage ring.

A prototype EDM ring is an intermediate step before building the final storage ring to demonstrate sufficient beam lifetime and SCT (Spin Coherence Time) in a pure electrostatic ring as well as in storage ring with combined electric and magnetic bending elements. In order to study the effect of E-B-deflectors on the orbit and the spin motion the software library Bmad is used. First results of the optics and spin simulations, with focus on the optimization of the SCT, towards the prototype EDM ring will be discussed.

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