

IPAC 2015 Abstract

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Abstract The measurement of a non-zero electric dipole moment (EDM) aligned along the spin of sub-atomic particles would probe new physics beyond the standard model. It has been proposed to search for the EDM of charged particles using a storage ring and a longitudinally polarized beam. The EDM signal would be a rotation of the polarization from the horizontal plane toward the vertical direction as a consequence of the radial electric field always present in the particle frame. This experiment requires ring conditions that can ensure a lifetime of the in-plane polarization (spin coherence time, SCT) up to 1000 s. At the COoler SYnchrotron (COSY) located at the Forschungszentrum Jülich, the JEDI collaboration has begun to examine the effects of emittance and momentum spread on the SCT of a polarized deuteron beam at 0.97 GeV/c. The set of data presented here shows how second-order effects from emittance and momentum spread of the beam affect the lifetime of the horizontal polarization of a bunched beam. It has been observed that sextupole fields can correct for depolarizing sources and increase the spin coherence time up to hundreds of seconds while setting the chromaticities equal to zero.

*Word Count: 193 Character Count: 1189***Footnote****Funding Agency** Forschungszentrum Jülich is a member of the Helmholtz Association

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