

## Contribution submission to the conference Bonn 2020

**Polarization measurements for storage ring electric dipole moment Investigations** — ●ACHIM ANDRES for the JEDI-Collaboration — Institute for Nuclear Physics II , FZ Jülich, Germany — III. Physikalisches Institut B, RWTH Aachen University, Germany

The matter-antimatter asymmetry in the universe cannot be explained by the Standard Model of elementary particle physics. According to A. Sakharov additional CP violating phenomena are needed in order to understand the matter-antimatter asymmetry. Permanent Electric Dipole Moments (EDMs) of subatomic elementary particles violate both time reversal and parity asymmetries and therefore also violate CP if the CPT-theorem holds. They could thus provide this additional CP violation.

The JEDI-Collaboration (Jülich Electric Dipole moment Investigations) is preparing a direct EDM measurement for protons and deuterons: first at the storage ring COSY (COoler SYNchrotron) at Forschungszentrum Jülich and later at a dedicated storage ring. As COSY is an all magnetic storage ring, a direct measurement of the EDM is not possible as polarization build up effects due to the EDM cancel out over time. The basic idea is to modulate the spin oscillation of deuterons and protons with a radio frequency (RF) Wien filter without perturbing the beam itself to measure a net vertical polarization build up due to the EDM. In this talk, a new method to match the fields inside the Wien Filter as well as the resonance frequency of the kicks of the magnetic field  $B_{WF}$  to the spin precession vector will be presented.

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