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The Search for Electric Dipole Moments of Charged Particles in Storage Rings

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The matter-antimatter asymmetry in the universe cannot be explained by the Standard Model of elementary particle physics. According to A. Sakharov, CP violating phenomena are needed 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.
Storage rings offer the possibility to measure EDMs of charged particles by observing the influence of the EDM on the spin motion. The Cooler Synchrotron (COSY) at Forschungszentrum Jülich provides polarized protons and deuterons up to a momentum of 3.7 GeV/c and is therefore an ideal starting point for the JEDI - Collaboration (Jülich Electric Dipole moment Investigations) to perform the first direct measurement of the deuteron EDM.
During this talk, recent results of the JEDI physics program are presented.

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