

Beam based alignment at the Cooler Synchrotron (COSY)

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There is a matter-antimatter asymmetry observed in the universe that can not be explained by the Standard Model of particle physics. To resolve that problem additional CP violating phenomena are needed. A candidate for an additional CP violating phenomenon is a non-vanishing Electric Dipole Moment (EDM) of subatomic particles. Since permanent EDMs violate parity and time reversal symmetries, they also violate CP if the CPT-theorem holds.

The Jülich Electric Dipole moment Investigation (JEDI) Collaboration works on a direct measurement of the electric dipole moment (EDM) of protons and deuterons using a storage ring. The JEDI experiment requires a small beam orbit RMS in order to measure the EDM. Therefore an ongoing upgrade of the Cooler Synchrotron (COSY) is done in order to improve the precision of the beam position. One of part of this upgrade is to determine the magnetic center of the quadrupoles with respect to the beam position monitors. This can be done with the so called beam-based alignment method. The first results of the beam based alignment measurement performed in February 2019 will be presented.