



Contribution ID: 24

Type: **Invited talk**

## Static and Oscillating EDM Searches of Charged Particles in Storage Rings

The Electric Dipole Moment (EDM) of subatomic particles serves as a source of CP violation, which could explain the observed matter-antimatter imbalance. Detecting an EDM larger than the tiny theoretical predictions from the Standard Model would indicate additional CP violation and point to new physics beyond the Standard Model.

Axions, initially proposed to resolve the strong CP problem, are leading candidates for dark matter. For low-mass axions or axion-like particles (ALPs), they behave as a classical field, inducing an oscillating EDM when coupled with gluons and potentially generating observable signals when the ALPs field frequency resonates with the beam's spin precession frequency.

Both static and oscillating EDM effects can create a measurable vertical polarization component, which can be detected using a polarimeter. The JEDI collaboration conducted the first direct measurement of the deuteron EDM and the first proof-of-principle search for axions or ALPs particles in a storage ring using polarized deuteron beams at the Cooler Synchrotron (COSY). In this talk, I will discuss these measurements and results, as well as potential future experiments.

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