

# Development of compact, highly-sensitive beam position monitors for storage rings

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## Abstract

The Jülich Electric Dipole Moment (JEDI) Collaboration is presently preparing for a first direct measurement of the deuteron Electric Dipole Moment (EDM) in a storage ring using a recently developed novel waveguide RF Wien filter. A non-vanishing EDM signal would provide a new source for  $CP$  violation which could explain one of the biggest mysteries in contemporary cosmology; namely the matter over antimatter asymmetry of the Universe. Spin rotations due to an EDM are many orders of magnitude smaller than rotations due to magnetic dipole moment, and in order to suppress systematic effects, the beam position in the RF Wien filter has to be determined with high precision. To this end, a new type of Beam Position Monitor (BPM) was developed which is based on a Rogowski pickup coil.

In this talk, the development of a laboratory test station for the Rogowski coil BPMs, the calibration measurements, and the beam determination of the geometrical center of the pickup coil using a laser tracker system are introduced. The calibrated coils will be installed at the entrance and exit of the RF-Wien filter in the COSY accelerator in January 2018.

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