

Compact beam position monitors based on a Rogowski pick-up for the COoler SYnchrotron COSY

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Abstract

One of the biggest questions in cosmology that has not yet been answered is the matter over anti-matter asymmetry in our universe. The Electric Dipole Moment (EDM) of sub-atomic particles would provide new sources for the CP violations and hence possibly answer that big cosmological question. The Jülich Electric Dipole moment Investigations (JEDI) collaboration is working on measuring the EDM of charged hadrons, as protons and deuterons, using the Cooler Synchrotron (COSY) storage ring in Jülich.

The search for EDM signal requires highly precise measurement conditions. The beam orbit for instance, needs to be well known and controlled. Therefore, beam position monitors (BPM) are required to deliver the transverse beam positions along the ring. The Rogowski coil operation, which is based on magnetic induction, is exploited in a compact and sensitive position monitor for storage rings. This poster will present the working principles and the most recent tests of a Rogowski-based beam position monitor. Simulations using COMSOL Multiphysics, carried out in both frequency and time domains, will also be presented.

Keywords

Rogowski, BPM, Storage rings, EDM