

Contribution submission to the conference Berlin 2024

Determining quadrupole magnetic length shortening in COSY using a Bmad model — •MICHAEL MARGOS — Institut für Kernphysik, FZ Jülich, Germany — III. Physikalisches Institut B, RWTH Aachen University, Germany — GSI Helmholtzzentrum für Schwerionenforschung GmbH, Darmstadt, Germany

Precision experiments, like the search for electric dipole moments (EDMs) in storage rings require very stable beam conditions and a very good understanding of the accelerator. The JEDI-Collaboration (Jülich Electric Dipole moment Investigations) in Jülich has modelled the storage ring COSY (COoler SYnchrotron) in the simulation software Bmad. A discrepancy between betatron tune measurements and computed betatron tune was found.

The primary suspect for this discrepancy is an inadequate description of quadrupole magnets, especially magnetic length shortening due to surrounding ferromagnetic material. Tune measurements with different quadrupole settings were measured and are compared to model tunes to determine actual quadrupole strength.

Part: AKBP
Type: Vortrag;Talk
Topic: Beam Dynamics
Keywords: betatron tune; quadrupole magnets;
magnetic length; bmad
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