ID: 3454 Orbit Response Matrix Analysis for COSY - Model Improvement Using LOCO

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Abstract The JEDI (Jülich Electric Dipole moment Investigations) collaboration in Jülich is preparing a direct Electric Dipole Moment (EDM) measurement of deuterons at the COoler Synchrotron (COSY) with the so called precursor experiment. In order to analyse the data of the experiment and to disentangle the EDM signal from systematic effects spin tracking simulations are needed. Therefore, the underlying model of COSY has to describe the real machine as accurately as possible. For optics and tracking simulations the software library Bmad is used. The model contains all types of magnets including their measured misalignments. Additionally, a model of the RF Wien filter device that is used within the EDM experiment is implemented. A comparison between the model and the machine optics was made by measuring the orbit response matrix at COSY. In order to improve the model and to minimize the discrepancies between model and machine the Linear Optics from Closed Orbit (LOCO) technique is a helpful tool. The algorithm was implemented and benchmarked with simulated data and could then be tested with the measured data. The benchmarking as well as first results towards the measurements are discussed.

Funding Agency

Type of Presentation Poster

Main Classification MC4: Hadron Accelerators

Sub Classification A04 Circular Accelerators