

Measurement of dC vector analyzing power and cross sections at COSY for EDM polarimetry

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The JEDI (Jülich Electric Dipole moment Investigations) collaboration performs a set of experiments at the COSY storage ring in Jülich, within the R&D phase to search for the Electric Dipole Moments (EDMs) of charged particles. A measurement of proton and deuteron EDMs is a sensitive probe of yet unknown CP violation. An EDM observation would also be an indication for physics beyond the Standard Model.

The method of charged particle EDM search will exploit stored polarized beams in order to observe a miniscule rotation of the polarization axis as a function of time due to the interaction of a finite EDM with large electric fields. Key challenge is the provision of a sensitive and efficient method to determine the tiny change of the beam polarization. Elastic scattering of the beam particles on carbon nuclei will provide the polarimetry reaction.

For this reason and as an input for future Monte-Carlo simulations, a good knowledge of the vector analyzing power and the unpolarized elastic cross section of deuterons scattered off a carbon target is very important to be able to determine the deuteron polarization. Over the course our experiment, the analyzing power and the differential cross section was measured using six different beam energies starting from 170 MeV up to 380 MeV deuterons.

In this talk an overview of the WASA detector setup installed at the COSY accelerator will be given and the results of the measured analyzing power and elastic cross section will be presented.

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