

Development of a Dedicated Precision Polarimeter for Charged Particle EDM searches at COSY

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The international JEDI (Jülich Electric Dipole moment Investigation) collaboration is preparing a first-ever direct measurement of the deuteron Electric Dipole Moment (EDM), using the COSY storage ring at Forschungszentrum Jülich (Germany).

A new polarimeter is required to detect the very slow and minuscule polarization change with time: starting in 2016, we have designed, built and commissioned a new modular type storage ring EDM polarimeter based on LYSO inorganic scintillator crystals. The polarimeter concept exploits LYSO modules (3x3x8 cm³), individually coupled to modern large area SiPM arrays which are operating at low voltage.

The detector system and its vacuum system have radial symmetry and a thin exit window, making the polarimeter very efficient for online up-down and left-right asymmetry measurements.

After several tests at the external COSY beam, we have recently installed the complete system in the COSY ring for use with internal beams.

In this talk, I will summarize the achievements of our group and discuss the latest results.

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Session Classification: Particle triggering, detection and tracking