

Towards EDM Polarimetry

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In the upcoming Jülich Electric Dipole moment Investigations (JEDI) project, the essential point would be to measure tiny beam polarization change over a long period. The particle scarcity in the polarized deuteron or proton beams and its slow extraction rate puts very difficult experimental limitations on the polarimetry. At present, the EDDA detector (build with plastic scintillators) is being used to measure proton and deuteron beam polarization at the COSY ring. But for the future EDM measurements, a dedicated high precision polarimeter is required. The new concept is based on the following principals:

Achieving maximum identification efficiency for the elastic events off carbon target, dead-time less data taking and avoiding strong magnetic and electric fields. Also, the experiment will last over several years, so the long-term stability and strong radioactive hardness is required.

To fulfill this specifications, a fast, dense, high resolution (energy and time), and radioactive hard novel crystal scintillating material LYSO is supposed to be used for particle detection/identification. The LYSO crystal samples, the PMT/SiPM photo-sensors and its HV dividers are under intensive tests/developments. Also, the SADC based readout system and the beam test of the first prototype is in preparation. In this presentation, the new polarimetry concept and all above mentioned activities at COSY will be presented.

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