

Development of LYSO detector modules for a charge-particle EDM polarimeter

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The JEDI (Jülich Electric Dipole moment Investigations) collaboration carries out preparations, R&D and a first proof-of-principle measurement for the challenging project to measure permanent electric dipole moments of charged particles using a storage ring. In the long term, the experiments are targeted at the construction of a novel storage ring including a new polarimeter based on inorganic LYSO crystals and low voltage Silicon Photomultipliers (SiPMs). In order to find the best material and assembling configurations, more than 50 modules have been assembled in different set-ups so far. Modules have first been tested in the laboratory with internal and external radiation sources and subsequently, they have been examined under experimental conditions employing accelerator beams. We have performed five test beam times at several different beam energies using the new DAQ system, which was optimized for the new polarimeter. The results of these measurements and the accumulated experience of the module production will be presented.