

Contribution submission to the conference Heidelberg 2015

FPGA-Based Upgrade of the Read-Out Electronics for the Low Energy Polarimeter at the Cooler Synchrotron — •NILS HEMPELMANN for the JEDI-Collaboration — Institut für Kernphysik, Forschungszentrum Jülich

The Cooler Synchrotron (COSY) is a storage ring used for experiments with polarized proton and deuteron beams. The low energy polarimeter is used to determine the vector and tensor polarization of the beam before injection at kinetic energies up to 45 MeV for protons and 75 MeV for deuterons. The polarimeter uses scintillators to measure the energy of both outgoing particles of a scattering reaction and the time between their detection. The present read-out electronics consists of analog NIM modules and is limited in terms of time resolution and the capability for online data analysis. The read-out electronics will be replaced with a new system based on analog pulse sampling and an FPGA chip for logic operations. The new system will be able to measure the time at which particles arrive to a precision better than 50 ps, facilitating better background reduction using coincidence measurement. In addition to measuring the beam polarization, the system will be used to precisely determine the vector and tensor analyzing powers for deuteron scattering off carbon at a kinetic energy of 75 MeV.

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