

## Contribution submission to the conference Darmstadt 2016

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

The Cooler Synchrotron (COSY) is a facility for cooled polarized beams at the Forschungszentrum in Jülich. The Low Energy Polarimeter (LEP [1,2]) is the polarimeter in the injection beam line of COSY [3]. The beam polarization is measured using scattering off carbon and polyethylene (CH<sub>2</sub>) targets. The outgoing particles are detected using twelve plastic scintillators installed in groups of three to the left, to the right, above, and below the beam. The LEP is the routine tool for beam set-up, but its performance was limited by the old read-out electronics consisting of analog NIM modules. A new system using analog pulse sampling and an FPGA chip for signal processing was installed and tested. The ejectile particles were identified by relative time of flight measurement using a signal from the RF amplifier of the cyclotron used for acceleration as a reference. The new system is able to measure the time at which a particle arrives to an accuracy in the order of 50 ps. The presentation includes a review of available systems and a report about measurements in May and December 2015.

[1] M. Eggert, Entwicklung eines gepulsten Casium-Ionenstrahls für die Quelle polarisierter Ionen an COSY/Jülich, PhD Thesis, 1998 [2] N. Hempelmann, FPGA-Based Upgrade of the Read-Out Electronics for the Low Energy Polarimeter at COSY/Jülich, Presentation at PSTP Bochum, 2015 [3] R. Maier, Nucl. Instr. and Meth. A 390 (1997) 1

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