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Novel type polarization analysis using multi-analyzer setup at PUMA

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The thermal triple-axis-spectrometer PUMA at the neutron research reactor FRM-II (MLZ) is one of the most robust, and yet extremely flexible instruments worldwide of its kind. In addition to the “*normal triple axis*” setup, PUMA delivers a good number of unique features to meet the ever-growing demands of the scientific community worldwide. Multiplexing, using the multi-analyzer and multi-detector systems is one of them, which consists of eleven arbitrarily configurable analyzer-detector channels. In particular, single-shot kinetic experiments are well suited as the setup allows the realization of an entire (Q, λ)-scan within a time scale even less than a minute as a

function of any external stimulant. Moreover, the same setup can be used for polarization experiments very efficiently. By directing the spatially separated different spin-states of the scattered neutrons into the different analyzer channels, the spin-flip (SF) and the non-spin flip (NSF) components can be simultaneously determined [1,2]. Especially in the case of kinetic time-resolved experiments, where both spin states need to be registered synchronously at the same state of the sample, this setup is of absolute necessity. In this talk, I will report on the details of the current status of polarization analysis setup at PUMA and present results from the pilot experiments.

References: [1] S. Schwesig et al., A 877 (2018) 124–130. [2] A. Maity et al., Physica Status Solidi B 257, 1900704 (2020).

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