

# Simultaneous determination of spin flip and non-spin flip neutrons using multi-analyzer setup at PUMA, FRM-II

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The thermal triple-axis-spectrometer PUMA is one of the most robust and yet extremely flexible instruments worldwide of its kind. In addition to the 'normal triple axis' set up, PUMA delivers a good number of unique features to meet the ever growing demands of the scientific community worldwide. One of them is the multiplex system, which consists of eleven arbitrarily configurable analyzer-detector channels. This is particularly suited for single shot kinetic experiments since it allows the realization of an entire (Q,E)-scan within a time scale even less than a minute as a function of any external stimulant. Moreover, this set up 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 determined simultaneously and to best of our knowledge none of the conventional existing neutron instruments collects both spin-states at the same time. Especially, in case of kinetic time-resolved experiments, where both spin states need to be registered synchronously at the same state of the sample, this set up is of absolute necessity. To allow an easy and efficient operation of this sophisticated polarization set up and provide support for subsequent data analysis, we have developed GUI based MAX-PA software. In this talk, I will report on the details of the current polarization analysis setup at PUMA and show few results from the pilot experiments.

#### References:

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- [2] O. Sobolev *et al.*, Nuclear Instruments and Methods in Physics Research A 772 (2015) 63–71.
- [3] G. Eckold *et al.*, Nuclear Instruments and Methods in Physics Research A 752 (2014) 54–64.

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