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PUMA: Thermal neutron three axes spectrometer

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Thermal neutron three axes spectrometer PUMA is characterized by a very high neutron flux as a result of the efficient use of focusing techniques. An innovative option of the spectrometer is the multianalyzer/detector system, which allows a unique and flexible type of multiplexing. Using this option, a scattering angle range of 16° can be measured simultaneously and flexible Q - ω paths can be realized without repositioning the instrument. The typical scientific applications of PUMA are studies of phonons and magnons. Furthermore, a unique feature of the instrument is the possibility to perform stroboscopic, time resolved measurements of both elastic and inelastic signals on time scales down to the microsecond regime. Using this technique, the sample is periodically perturbed by an external variable such as temperature, electric field, etc. The signal is then recorded not only as a function of momentum and energy transfer, but also given a time stamp, relative to the periodic perturbation. Since 2021, the Neutron Scattering Group of the Institute of Quantum Materials and Technologies (IQMT, www.iqmt.kit.edu) of the Karlsruhe Institute of Technology (KIT) has been jointly operating the PUMA three-axes spectrometer at MLZ within the framework of a collaboration contract. The purpose of the collaboration is to promote the scientific program, support the user program and develop instrumental capabilities.

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