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PANDA –The high flux, cold neutron three-axis spectrometer at MLZ

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PANDA is the cold three-axis spectrometer at MLZ, successfully serving scientists from around the world since 2005. In preparation for continued user operations, the instrument has undergone comprehensive maintenance and upgrades. It is now equipped with a new double focusing PG-002 monochromator, a versatile sample table capable of supporting cryomagnets, dilution inserts (50 mK) and a new ADR cryostat operating continuously from room temperature down to 300 mK (and 100 mK in single-shot mode). Translational and rotational degrees of freedom are retained even with the heaviest equipment.

Due to the thermal overlap in the incoming neutron spectrum, PANDA will be ready for experiments immediately upon the restart of user operations. Planned addition of a Cu-111 and a bent Si-111 monochromator aim to extend the energy range or minimize second-order contamination, respectively. Simulations indicate that the incoming flux at the sample position will reach 1.8 × 107 n/cm²/s at ki = 1.9 1/Å. Standard PG-filter experiments for energy transfers up to ΔEmax ≈ 35 meV, as well as high-resolution Be-filter experiments up to ΔEmax ≈ 12-15 meV can be performed, albeit neutron flux is reduced for low energy and high-resolution experiments.

A key aspect of PANDA's restart will be the commissioning of the BAMBUS multiplexing option. Although it is designed for a cold spectrum, immediate tests, background characterization, and software validation are needed to enable its use as soon as possible.

Authors: SCHNEIDEWIND, Astrid (Forschungszentrum Jülich GmbH); Dr BEDDRICH, Lukas (Jülich Centre for Neutron Science (JCNS) at MLZ, Forschungszentrum Jülich GmbH, Garching, Germany)

Presenter: Dr BEDDRICH, Lukas (Jülich Centre for Neutron Science (JCNS) at MLZ, Forschungszentrum Jülich GmbH, Garching, Germany)

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