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New options on the polarized neutron single crystal diffractometer POLI at MLZ

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Polarized neutron diffraction is a powerful tool for studying condensed matter physics and to probe the spin and orbital properties of unpaired electrons. POLI is a polarized neutron single crystal diffractometer built on the hot neutron source at MLZ. Currently three standard setups are implemented on POLI: 1) zero-field spherical neutron polarimetry using CRYOPAD; 2) polarized neutron diffraction in magnetic fields; 3) non-polarized diffraction under various conditions.

We recently implemented a new actively shielded asymmetric split-coil superconducting magnet with a maximal field of 8T. The magnet is designed to facilitate polarized neutron diffraction with low stray fields, a large opening (30 ° vertical) and a large sample space suitable for e.g., piezo goniometers, and pressure cells. We also built a compact-size solid-state supermirror bender polarizer optimized for short neutron wavelengths to provide high neutron polarization in the vicinity of the magnet. An in-situ SEOP polarizer and analyzer will be available soon which maintains high levels of neutron polarization and intensity over long periods of time. The SEOP polarizer are well shielded magnetically and can be used with the large magnet. Transferring the BIDIM26 area detector of size 26cm by 26cm from LLB to MLZ is in progress [3].

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