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Upgrades of the neutron scattering instruments at MLZ for soft matter research

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Many interesting scientific proposals for soft matter research are submitted to MLZ twice a year, and lead to ca. 30% of the scientific output. The soft matter group at MLZ practices also own in-house research that is tightly connected to TUM & LMU activities and strongly supported by Forschungszentrum Jülich with its activities. This concept with active research enables the soft matter group to drive the instrument development towards the future scientific needs with continuously raising complexity. The mostly soft matter related instruments are the small angle diffractometers KWS-1, -2 and -3, the spin echo spectrometer J-NSE, the backscattering spectrometer SPHERES, and the reflectometer MARIA. The instruments KWS-1 and -2 are equipped with large area detectors from GE/Reuter-Stokes that count several MHz of neutrons. Furthermore, polarization analysis allows to precisely subtract the unwanted incoherent scattering. The J-NSE instrument is furnished with superconducting coils that reduce the statistic noise to the lowest level worldwide. SPHERES suppresses unwanted background with a new chopper. MARIA with its velocity selector serves for highest intensities in the field. The sample environment for all instruments is continuously developed. For instance microfluidics will support the demand for smallest sample volumes that often limit conventional experiments. With this new instrument suite, the MLZ is prepared for the demanding soft matter experiments of the next decade.

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