



## Scientific applications with the high resolution neutron backscattering spectrometer SPHERES

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The SPectrometer for High Energy RESolution SPHERES at MLZ is a third generation backscattering spectrometer with focusing optics and phase-space transform (PST) chopper. Both these main components have been upgraded over the years, resulting in a more than doubled intensity. The latest upgrade encompassed the introduction of a background chopper, allowing for a low background operation with a significantly increased signal-to-noise ratio.

SPHERES enables investigations on a broad range of scientific topics. It provides high energy resolution with a good signal-to-noise ratio and is a versatile instrument for the investigation of atomic and molecular dynamics on a  $\mu\text{eV}$  scale. It is particularly sensitive to the incoherent scattering from hydrogen and allows to access dynamic processes up to a timescale of a few ns. It is therefore well suited to study the dynamics in soft matter materials like polymers and nanocomposites or the motions in biological systems such as proteins. Another important application is the investigation of energy materials, for instance the study of diffusion processes in fuel cells. Other typical applications are hyperfine splitting in magnetic materials or rotational tunneling and molecular reorientations.

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**Sitzung Einordnung:** Mounting Posters, Beer and light Dinner

**Track Klassifizierung:** Instrumentation & Data Management