High-resolution neutron backscattering spectroscopy at the Institut Laue-Langevin

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High-resolution cold neutron backscattering spectroscopy evolves continuously with advances in neutron optics. This method provides access to the van Hove correlation function on nanometer length scales and nanosecond time scales. It is for instance applied to explore diffusion phenomena, e.g. in polymers, catalytic chemistry, hydrogen mobility in fuel cells, relaxation in lipid membranes, zeolites, biological systems, dynamics in nanometer-scale confinement in general, any many other topics.
Following a basic tutorial introduction to the method, recent advances in optics using so-called ballistic neutron guides and Bragg reflections in moving reference frames will be discussed. An account of the very recently commissioned spectrometer IN16B will thereby be given. Subsequently, a few examples of application will be presented.