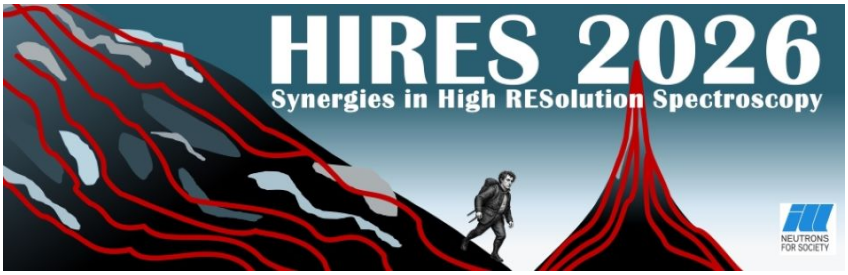

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Intensity Modulated Methods for Time-of-Flight Neutron Spectroscopy

Inelastic neutron scattering measurements are usually (except on Spin Echo), performed by knowing the initial and final energy of each neutron detected. This information is used to obtain the double differential scattering cross section, $d^2\sigma/d\Omega d\omega$, the probability of a scattered neutron being directed in the solid angle between Ω and $\Omega+d\Omega$ having exchanged an energy between $\delta E=\hbar\omega$ and $\delta E+d\delta E$. Here we present new approaches on how to obtain the same quantity, or more precisely its Fourier transform, using a neutron beam whose intensity is modulated in time. The instruments based on this idea, still at the conceptual level, have been named Neutron Intensity Modulated Spectrometers (NIMS). This approach is beneficial for using Time-of-Flight methods on continuous sources. NIMS could potentially improve the data acquisition rate by two orders of magnitude for a broad range of experiments, particularly Quasi Elastic Neutron Scattering (QENS) where the energy broadening of the elastic line is measured.

Session

Instrumentation

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