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## New opportunities for liquid neutron spectroscopy at ISIS

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Quasi-elastic neutron spectroscopy of liquids is in common usage at the ISIS Neutron and Muon Source, UK, to examine incoherent (non-propagating) dynamical properties, such as diffusion constants and local internal molecular modes. However, it is much more difficult to measure coherent excitations in liquids with neutrons due to their kinematical constraints - namely the rather limited range of excitation energies at low momentum transfers, where the coherent liquid modes must be measured.

As a result, coherent liquid spectroscopy is most commonly attempted using inelastic X-ray scattering. In principle, however, neutron spectroscopy should be able to provide much better data than IXS, since the energy resolution is generally much better, and the line-shape is a well-behaved Gaussian function rather than a Lorentzian. We will present recent data taken on the LET and MERLIN direct geometry neutron time-of-flight spectrometers on propagating excitation modes in liquids, including measurements under pressure.

We will also present an instrument concept called BRILL, which is a recently-proposed direct geometry neutron time-of-flight spectrometer at ISIS, dedicated to the measurement of low-momentum transfer propagating excitations.

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