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Spectroscopy of quasiparticle excitations in quantum Hall fluids¹

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Quantum Hall fluids support low-energy excitation modes that are linked to remarkable behaviors that emerge from fundamental interactions in two-dimensions. Inelastic light scattering methods at very low temperatures (below 1 Kelvin) offer unique experimental venues to study excitations in the charge and spin degrees of freedom of the fluids. This talk presents an overview of recent results. The focus is on low-lying excitations that express distinct quantum phases of the electron liquids. The experiments offer insights on translational symmetry, on magnetoroton excitations and on quasiparticle energy level structure. The excitations are probed in diverse states of the electron liquids to provide insights on quasiparticle properties and on the phase transformations between quantum fluid states.

¹In collaboration with Y. Gallais, J. Groshaus, J. Yan, T. Kirschenmann, C.F. Hirjibehedin, I. Dujovne, B.S. Dennis, L.N. Pfeiffer and K.W. West.