

Abstract Submitted
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Low-Energy Excitations in the Second LL: Fundamental Insights from Inelastic Light Scattering¹ URSULA WURSTBAUER, Walter Schottky Institut TU München, ARON PINCZUK, ANTONIO L. LEVY, Columbia University, JOHN WATSON, SUMIT MONDAL, MICHAEL J. MANFRA, Purdue University, KEN WEST, LOREN PFEIFFER, Princeton University — The competition between quantum phases that dictates the physics in the second Landau level (SLL) results in striking phenomena. Our work explores this fascinating interaction physics by measurements of low-lying neutral excitation modes in the SLL from resonant inelastic light scattering experiments. We focus here on the marked differences of the low-lying collective excitation spectra of the even-denominator state at $\nu=5/2$ with those in the range $5/2 < \nu < 2$. Filling factor $5/2$ is characterized by the presence of gapped modes, a spin mode exactly at E_Z and the absence of a continuum of low-lying excitations. In contrast, a continuum of low-lying excitations and gapped modes are coexistent at $\nu=2+1/3$, $2+3/8$ and $2+2/5$ and the spin-modes appear significantly below E_Z . All observed modes weakens with smallest variations in filling factor substantiating the transition from an incompressible quantum Hall fluid to compressible states.

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