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Quantum Hall Exciton Condensation at Full Spin Polarization[1]
A.D.K. FINCK, J.P. EISENSTEIN, California Institute of Technology, L.N. PFEIFFER, K.W. WEST, Princeton University — Using Coulomb drag as a probe, we explore the excitonic phase transition in quantum Hall bilayers at $\nu_T = 1$ as a function of Zeeman energy, E_Z. The critical layer separation $(d/\ell)_c$ for exciton condensation initially increases rapidly with E_Z, but then reaches a maximum and begins a gentle decline. At high E_Z, where both the excitonic phase at small d/ℓ and the compressible phase at large d/ℓ are fully spin polarized, we find that the width of the transition, as a function of d/ℓ, is much larger than at small E_Z and persists in the limit of zero temperature. We discuss these results in the context of two models in which the system contains a mixture of the two fluids.

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