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Interlayer tunneling studies of highly imbalanced bilayer 2D electron systems at $\nu_T = 1$ A.R. CHAMPAGNE, J.P. EISENSTEIN, Caltech, L.N. PFEIFFER, K.W. WEST, Bell Labs — When the separation between two parallel 2-dimensional electron systems (2DES) becomes comparable to the average distance between electrons within a single layer, the system can support a quantum Hall state with total filling factor $\nu_T = 1$. This state can be described as a Bose condensate of excitons. Previous studies [1] have shown that close to the $\nu_T = 1$ phase boundary, a small imbalance in the number of electrons in each layer can strengthen the condensate. We report on interlayer tunneling measurements of the effect of large imbalances as a function of the interlayer spacing. We explore the possibility of competing order between the excitonic state and the (1/3, 2/3) fractional states in the individual layers. This work was supported by the NSF and the DOE.
[1] I. B. Spielman, et al., Phys. Rev. B **70**, 081303 (2004).

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