Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

**Tunneling and the Collective Mode Spectrum of Strongly Correlated Bilayer 2D Electron Systems** X. LOPEZ-YGLESIAS, I.B. SPIELMAN, J.P. EISENSTEIN, Caltech, L.N. PFEIFFER, K.W. WEST, Bell Labs — Bilayer 2D electron systems at $\nu_T = 1$ show a huge and sharply resonant peak in the interlayer tunneling conductance at zero bias if the layer separation is sufficiently small[1]. This Josephson-like effect is a signature of the long wavelength Goldstone collective mode characteristic of the pseudo-ferromagnetic (or excitonic) ground state of the system. Application of an in-plane magnetic field has allowed for verification of the linear wave-vector dependence of this mode[2]. In this talk we will report measurements of the various low energy features of the tunnel spectrum as functions of temperature, energy, and in-plane magnetic field. In particular, we will discuss the results of a search for the expected magneto-roton minimum in the collective mode spectrum when the system is near the critical layer separation. This work was supported by the NSF and the DOE. [1] I.B. Spielman, et al., Phys. Rev. Lett. **84**, 5808 (2000). [2] I.B. Spielman, et al., *ibid.*, **87**, 036803 (2001).

James Eisenstein
Caltech

Date submitted: 29 Nov 2004 Electronic form version 1.4