

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Spin excitations at $\nu > 1/3$: a probe of composite fermions interactions YANN GALLAIS, THOMAS KIRSCHENMANN, IRENE DUJOVNE, CYRUS HIRJIBEHEDIN, Columbia University, BRIAN DENNIS, Bell labs, Lucent, ARON PINCZUK, Columbia University, KEN WEST, LOREN PFEIFFER, Bell labs, Lucent — We present a resonant inelastic light scattering study of spin excitations at filling factors of the fractional quantum Hall effect (FQHE) with $\nu > 1/3$, in which composite fermions may condense into higher order quasiparticles. Observations of low lying spin excitations enable us to study the composite fermions (CF) Landau level configuration and the impact of CF residual interactions at filling factors away from the major FQHE sequences. A very low energy spin mode ($\omega \leq 0.1$ meV), which displays a marked temperature dependence above $T \sim 100$ mK, emerges at filling factors close to $\nu = 4/11$ and remains with small changes in energy in the filling factor range $4/11 \leq \nu \leq 5/13$. The spectral intensity of this spin excitation becomes negligible at temperatures above 300 mK. The marked temperature dependence of the intensity suggest the existence of even lower excitation modes at energies well below 0.1 meV. We discuss the implication of these experiments on the possibility of higher order CF suggested by transport measurements at $\nu = 4/11$. This work is supported by the NSF under Award Number DMR-03-52738 and by the DoE award DE-AIO2-04ER46133. It is also supported by a research grant of the W. M. Keck Foundation.

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Date submitted: 03 Dec 2004

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