

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

The even denominator fractional quantum Hall states at large Landau level mixing NODAR SAMKHARADZE, MICHAEL MANFRA, GABOR CSATHY, Purdue University, LOREN PFEIFFER, KEN WEST, Princeton University — We present a study of the energy gaps of the even denominator fractional quantum Hall states of the second Landau level in a two-dimensional electron gas with a record low density of $n = 8.2 \times 10^{10} \text{ cm}^{-2}$. These measurements are motivated by the expectation that Landau level mixing present in samples of low densities breaks the degeneracy of the Pfaffian and its particle-hole conjugate anti-Pfaffian. Cooling the electron gas in our Helium-3 immersion cell to 5mK reveals at filling factor $5/2$ a fully quantized Hall plateau and a vanishingly small magnetoresistance. Because of the low density of our sample, the $5/2$ fractional state is observed at the highest degree of Landau level mixing reported to date. We have measured the energy gaps of the $5/2$ and $7/2$ fractional quantum Hall states. The intrinsic gap deduced in the limit of no disorder will be compared to previously reported values for samples with higher densities.

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Date submitted: 26 Nov 2010

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