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Anomalous density dependence of the activation gap of ν =5/2 fractional quantum Hall state at extremely large Landau level mixing NODAR SAMKHARADZE, MICHAEL MANFRA, Purdue University, LOREN PFEIFFER, KEN WEST, Princeton University, GABOR CSATHY, Purdue University — We have conducted a study of the density dependence of ν =5/2 fractional quantum Hall state (FQHS) in the regime of extremely low densities, down to n=4.9x10ˆ10 cmˆ-2. In the density range accessed in our sample, the Landau level mixing parameter κ spans the so far unexplored range 2.52<κ <2.82. Here we observe an anomalous dependence of the activation gap of ν =5/2 FQHS on the carrier density. We discuss the possible origins of this unexpected behavior. N.S. and G.C. were supported by the NSF grant DMR-0907172 and DMR-1207375. K. West and L. Pfeiffer acknowledge the support of the Princeton NSF-MRSEC and the Moore Foundation.

Nodar Samkharadze
Purdue University

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