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Quantitative analysis of the disorder broadening and the intrinsic gap for the ν=5/2 fractional quantum Hall state NODAR SAMKHARADZE, JOHN WATSON, GEOFF GARDNER, MICHAEL MANFRA, Purdue University, LOREN PFEIFFER, KEN WEST, Princeton University, GABOR CSATHY, Purdue University — We analyze several different methods of extracting intrinsic gaps of fractional quantum Hall states (FQHS) of the second Landau level from experimental data. Because of the discrepancy between these methods, we introduce a new way of estimating the disorder broadening in the second Landau level based on scaling of the gaps of the major odd denominator states. The results of our technique are in good agreement with a previously used method utilizing only the gaps of the even denominator states. We successfully apply this technique to several samples of high quality and find an excellent agreement between the estimated intrinsic gap and results of numerical simulations. We also report, for the first time, the dependence of the intrinsic gap of ν=5/2 FQHS on Landau level mixing. This work was supported by the NSF grant DMR- 0907172.

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