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Study of integer quantum Hall transition in long-ranged potentials[1] RAVINDRA BHATT, Department of Electrical Engineering, Princeton University, Princeton, NJ 08544-5263, A. CHANDRAN, Princeton University, Princeton, NJ 08544 — We present results of a numerical study of a two-dimensional system of noninteracting electrons in a random correlated potential in the lowest Landau level in the presence of a perpendicular magnetic field. We use spatially uncorrelated and unbiased random gaussian potentials as well as potentials $V(r)$ with long-range, power-law correlations $\langle V(0)V(r)\rangle \propto r^{-\alpha}$ for different exponents α as models of disorder. We compute the Hall conductance σ_{xy} as well as the Thouless conductance as a function of size L of the sample, and use finite size scaling to determine the exponent ν characterizing the divergence of the localization length ξ at the quantum Hall transition. We also study the scaling of the diagonal conductivity as a function of L and compare our results to those obtained previously through different methods.

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