Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 08.8 (C)

Wave function multifractality and dephasing at quantum Hall transitions: A numerical investigation S. BERA, Institut Neel, CNRS, Grenoble., I.S. BURMISTROV, L. D. Landau Institute for Theoretical Physics, Moscow, Russia, F. EVERS, Karlsruhe Institut fur Technologie, Germany, I. GORNYI, Karlsruhe Institut fur Technologie, Germany and A. F. Ioffe Physico Technical Institute, St. Petersburg, Russia, A.D. MIRLIN, Karlsruhe Institut fur Technologie, Germany and Petersburg Nuclear Physics Institute, St. Petersburg, Russia
— To understand the effect of the Coulomb interaction is one of the most challenging problems in the context of Anderson localization and the quantum Hall effect. In our study we address this question by following a perturbation theory in the interaction near the non-interacting fixed point. In each order diagrams appear which contain correlation functions characterizing the fluctuation properties of wavefunctions at the (non-interacting) critical fixed point. It turns out that the correlators relevant for dephasing combine in a way such that the *leading* multifractal powerlaws cancel; the subleading terms govern the interaction corrections. We present a numerical study based on the Chalker-Coddington network, in which we determine quantitatively the subleading multifractal exponents of the salient wavefunction correlators.

[X] Prefer Oral Session
[ ] Prefer Poster Session

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Date submitted: 19 Dec 2011 Electronic form version 1.4