Abstract Submitted
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Critical behavior of the transport coefficients at the Chern-to-normal insulator transition[1] YU XUE, EMIL PRODAN, Yeshiva University, New York, NY — Using the non-commutative Kubo formula for disordered lattice systems, we mapped the conductivity tensor $\sigma_{xx}(E_F,T)$ and $\sigma_{xy}(E_F,T)$ as function of Fermi level E_F and temperature T, for a model of a Chern insulator in the presence of strong disorder. In line with previous studies, σ_{xy} displays a quantized non-trivial value near the half-filling, value that changes rapidly to a trivial value as E_F crosses a critical value E_F^c. As expected, the T-dependence of σ_{xx} display the typical signature of the insulating behavior, except at E_F^c. Examining the resistivity tensor $\hat{\rho} = \hat{\sigma}^{-1}$, we found that the data looks extremely similar to the experimental data for the plateau-insulator transition in the Integer Quantum Hall Effect: 1)$\rho_{xx}(E_F,T)$ vs E_F plots for various temperatures intersect each other at precisely one point; 2) At this E_F^c, $\rho_{xx} \approx 1$ and $\sigma_{xy} \approx 0.5$; 3) The plots near E_F^c for different temperatures collapse into one curve when rescaled with an exponent that is consistent with the universally accepted value.

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