Quantum Hall criticality in an amorphous Chern insulator

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We explore the critical properties of a topological transition in a two-dimensional, amorphous lattice with randomly distributed points. The model intrinsically breaks the time-reversal symmetry without an external magnetic field, akin to a Chern insulator. Here, the topological transition is induced by varying the density of lattice points or adjusting the mass parameter. Using the two-terminal conductance and multifractality of the wavefunction, we found that the topological transition belongs to the same universality class as the integer quantum Hall transition. Regardless of the approach to the critical point across the phase boundary, the localization length exponent remains within $\nu \approx 2.55$–2.61. The irrelevant scaling exponent for both the observables is $y \approx 0.3(1)$, comparable to the values obtained using transfer matrix analysis in the Chalker-Coddigton network. Additionally, the investigation of the entire distribution function of the inverse participation ratio at the critical point shows possible deviations from the parabolic multifractal spectrum at the anomalous quantum Hall transition.

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