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Continuum models for the quantum Hall effect in the absence of Landau levels DAVID BAUER, FENNER HARPER, RAHUL ROY, University of California, Los Angeles — We study a family of topologically nontrivial Hamiltonians in two dimensions distinct from both Chern insulator and Landau level models to elucidate the role of single-particle bands in the formation of quantum Hall states. We use reciprocal space geometry to quantify deviations of these bands from Landau level behavior and and draw connections with other geometric properties of the bands, including the Hall viscosity. We predict a range of experimental parameters in two-dimensional lattice systems for which quantum Hall states are stable yet non-Landau level behavior may be observed.

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