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Models for the phase transition between a Fermi liquid and fractional Chern insulator¹ JOEL MOORE, University of California, Berkeley and Lawrence Berkeley National Laboratory, MICHAEL ZALETEL, SIDDHARTH PARAMESWARAN, University of California, Berkeley — A partially filled band with nonzero Chern density can support fractional quantum Hall states (“fractional Chern insulators”) as a consequence of repulsive interactions between electrons. In the absence of this repulsion, the ground state is generically a simple band metal with an anomalous Hall effect. There are several possible scenarios for a second-order transition between metallic and quantum Hall states, which can be approached as a composite-fermion band crossing, a coupling between Luttinger liquids, or via a parton construction. We discuss the extent to which these scenarios lead to different predictions and test those predictions by density-matrix renormalization group calculations.

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