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Topological order in lattice models of strongly interacting electrons STEFANOS KOURTIS, Institute for Theoretical Solid-State Physics, IFW Dresden, 01171 Dresden, Germany, TITUS NEUPERT, Princeton Center for Theoretical Science, Princeton University, Princeton, New Jersey 08544, USA, CLAUDIO CHAMON, Physics Department, Boston University, Boston, Massachusetts 02215, USA, CHRISTOPHER MUDRY, Condensed Matter Theory Group, Paul Scherrer Institute, CH-5232 Villigen PSI, Switzerland — Fractional Chern insulators are a class of strongly interacting topological states of electronic matter. So far, the paradigm of fractional Chern insulators was that they appear when interacting electrons with frozen spin degree of freedom populate relatively flat topological bands, with the interaction strength being smaller than the gap to other bands. In this talk, it will be shown that this limit is adiabatically connected to the opposite one, in which the interaction strength goes to infinity, thus exceeding the gap to other bands. Electrons then become extended hard-core particles, the notion of bands becomes meaningless and the connection to Landau-level physics of the fractional quantum-Hall effect is much less obvious. We also find fractional Chern-insulator states to be extremely robust in this hardcore limit, reaching up to, or possibly beyond, the noninteracting topological phase transition.

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