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Interaction induced topological phases in partially flat band graphene-like systems JÖRN W.F. VENDERBOS, LIANG FU, Massachusetts Inst of Tech-MIT — In this work we show how periodically modulated strain fields lead to partially flat bands resembling Landau level quantization due to pseudo-magnetic fields. These partially flat pseudo-Landau levels occur in systems such as graphene or at the interface between a trivial and topological crystalline insulator, where in both cases strain fields couple as pseudo-gauge fields. With these examples in mind, we discuss several different physical implementations. Periodically modulated strain fields hold the promise of realizing Quantum Hall physics on a large scale, whereas constant pseudo-magnetic fields are generally limited to the nanoscale. The electronic properties of these systems being fundamentally altered by the formation of these flat bands, we investigate the effect of electron-electron interaction and find that they induce topological phases, notably the Quantum Anomalous Hall state.

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