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Quantum Hall Superfluids in Topological Insulator Thin Films DAGIM TILAHUN, BYOUNGHAK LEE, Texas State Univ., EWELINA HAN-KIEWICZ, Universität Würzburg, ALLAN MACDONALD, University of Texas at Austin — Three-dimensional topological insulators have protected Dirac-cone surface states. In this paper we propose magnetic field induced topological insulator thin film ordered states in which coherence is established spontaneously between top and bottom surfaces. We find that the large dielectric constants of these materials increases the layer separation range over which coherence survives and decreases the superfluid sound velocity, but has little influence on superfluid density or charge gap. The coherent state at total Landau-level filling factor $\nu_T = 0$ is predicted to be free of edge modes, qualitatively altering its transport phenomenology.

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