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Topological insulators in staggered flux systems YIFU ZHANG, Dept. of Physics & Astronomy, Louisiana State University — Topological insulators are generally characterized by the Z_2 index, which requires time-reversal symmetry. On the other hand, the staggered flux states, known as orbital antiferromagnetic or charge flux phases, break both time-reversal and translational symmetry. In this work, we investigate the behavior of topological insulators within staggered flux. Interestingly, gapless edge states consisting of counter-propagating states with opposite spins survive, and in some regions, a phase with two such pairs of edge states emerges. We examine the robustness of these phases in the presence of disorder and study the topological phase transitions by varying the disorder strength. These systems demonstrate topological properties similar to but different from the ones predicted by the well-known Z_2 topological theory.

Yifu Zhang
Dept. of Physics & Astronomy, Louisiana State University

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