

Abstract Submitted
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Symmetry-enforced quantum spin Hall insulators in π -flux models¹ JIAXIN WU, TIN-LUN HO, YUAN-MING LU, Ohio State Univ - Columbus — We prove a Lieb-Schultz-Mattis theorem for the quantum spin Hall effect (QSHE) in π -flux models. In the presence of time reversal, U(1) charge conservation and magnetic translation (π -flux per unit cell) symmetries, if a gapped Hamiltonian has a unique symmetric ground state at half filling (one electron per unit cell), it can only be a QSH insulator i.e. a trivial Mott insulator ground state is forbidden. We further show that such a symmetry-enforced QSHE can be realized in cold atoms, by shaking optical lattices and applying an oscillating Zeeman field.

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