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Chiral spin liquid and emergent anyons in a Kagome lattice Mott insulator BELA BAUER, Microsoft Corp, LUKASZ CINCIO, Perimeter Institute, BRENDAN P. KELLER, University of California, Santa Barbara, MICHELE DOLFI, ETH Zurich, GUIFRE VIDAL, Perimeter Institute, SIMON TREBST, University of Cologne, ANDREAS W. W. LUDWIG, University of California, Santa Barbara — One of the earliest proposals for a topological phase in a quantum spin system was the chiral spin liquid put forward by Kalmeyer and Laughlin in 1987 as the bosonic analogue of the fractional quantum Hall effect. Here, we examine a physically motivated model for a Mott insulator on the Kagome lattice with broken time-reversal (TR) symmetry that gives rise to a chiral spin liquid. We present unambiguous numerical identification and characterization of the universal topological properties of the phase, including ground state degeneracy, edge physics, and anyonic bulk excitations. To this end, we use a variety of powerful numerical probes, including the entanglement spectrum and modular transformations. We then discuss the phase diagram resulting from the competition of the TR symmetry breaking chiral term and a TR-symmetric Heisenberg term, which on the Kagome lattice has been argued to give rise to a TR-symmetric topological phase. In particular, we elucidate the dynamics of the chiral phase upon approaching the putative topological phase transition.

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