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Measurement-based quantum teleportation on finite AKLT chains AKIHIKO FUJII, DAVID FEDER, University of Calgary — In the measurement-based model of quantum computation, universal quantum operations are effected by making repeated local measurements on resource states which contain suitable entanglement. Resource states include two-dimensional cluster states and the ground state of the Affleck-Kennedy-Lieb-Tasaki (AKLT) state on the honeycomb lattice. Recent studies suggest that measurements on one-dimensional systems in the Haldane phase teleport perfect single-qubit gates in the correlation space, protected by the underlying symmetry. As laboratory realizations of symmetry-protected states will necessarily be finite, we investigate the potential for quantum gate teleportation in finite chains of a bilinear-biquadratic Hamiltonian which is a generalization of the AKLT model representing the full Haldane phase.

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