

Abstract Submitted
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Fingerprints of bosonic symmetry protected topological state in a quantum point contact RUI-XING ZHANG, CHAO-XING LIU, Department of Physics, The Pennsylvania State University — In this work, we study the transport through a quantum point contact for two-channel interacting helical liquids that exist at the edge of a bilayer graphene under a strong magnetic field. We identify “smoking gun” transport signatures to distinguish bosonic symmetry protected topological (BSPT) state from fermionic two-channel quantum spin Hall (QSH) state in this system. In particular, a novel charge insulator/spin conductor phase is found for a weak repulsive interaction in the BSPT state, while either charge insulator/spin insulator or charge conductor/spin conductor phase is expected for the two-channel QSH state. In the strong interaction limit, shot noise measurement for the BSPT state is expected to reveal charge- $2e$ instanton tunneling, in comparison with the charge- e tunneling in the two-channel QSH phase.

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