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Spin Josephson effect at the quantum spin Hall edge VASUDHA SHIVAMOGGI, QINGLEI MING, TAYLOR HUGHES, Department of Physics, University of Illinois, MATTHEW GILBERT, Department of Electrical and Computer Engineering, University of Illinois, SMITHA VISHVESHWARA, Department of Physics, University of Illinois — We study a spin Josephson effect in a ferromagnetic junction at the quantum spin Hall (QSH) edge. The helical nature of the QSH edge states has striking consequences for the transport properties of such a junction. We derive an expression for the spin current through the junction as a function of the change in magnetization, similar to the current-phase relation of a Josephson junction. We discuss the novel transport properties of the junction that result from fractionally charged excitations hosted by the QSH edge.

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