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Scanning SQUID measurements of current flow in InAs/GaSb Quantum Wells ERIC SPANTON, Stanford Institute for Materials and Energy Sciences, LINGJIE DU, Rice University, KATJA NOWACK, Stanford Institute for Materials and Energy Sciences, GERRY SULLIVAN, Teledyne Scientific, RUI-RUI DU, Rice University, KATHRYN MOLER, Stanford Institute for Materials and Energy Sciences — InAs/GaSb quantum wells have been predicted theoretically to exhibit the quantum spin hall phase in the inverted regime. In this phase, spin-polarized helical edge modes are expected to exist. Previous published results on length and width dependence of InAs/GaSb 4-terminal devices suggests these helical edge states coexist with a residual bulk conductivity when the device is tuned into the minigap. We probe the spatial distribution of currents in devices using a scanning SQUID to measure the resulting magnetic fields. Specifically, we find that when the device is tuned into the gap with a front gate, current flows along the edge and coexists with bulk current. We also look at dependence on back gate voltage and temperature dependence.

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