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Local probing of Quantum Spin Hall edge states MARKUS KÖNIG, MATTHIAS BAENNINGER, ANDREI GARCIA, Stanford University, CHRISTOPH BRÜNE, HARTMUT BUHMANN, LAURENS MOLENKAMP, University of Wuerzburg, DAVID GOLDHABER-GORDON, Stanford University — Since their recent experimental discovery, topological insulators have attracted a lot of interest. The two-dimensional manifestation of a topological insulator, the Quantum Spin Hall (QSH) state, is characterized by counter-propagating edge states with opposite spin-polarization, while the bulk is insulating. Previous experiments on HgTe quantum well devices have proven the existence of the QSH state in this material and also demonstrated that the transport is indeed due to edge states. We use Scanning Gate Microscopy to study the edge channels of the QSH state. Utilizing the high spatial resolution of this technique, we can get insight into the spatial properties of the edge states. Furthermore, the experiments can yield information regarding the sensitivity of the QSH edge states to local perturbations, which can be useful for future applications.

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