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Terahertz Quantum Hall Effect of Dirac Fermions in a Topological Insulator A. PIMENOV, A. SHUVAEV, TU Vienna, Austria, G. ASTAKHOV, G. TKACHOV, CH. BRUENE, H. BUHMANN, L. W. MOLENKAMP, University of Wuerzburg, Germany — Using THz spectroscopy in external magnetic fields we investigate the low-temperature charge dynamics of strained HgTe, a three dimensional topological insulator. From the Faraday rotation angle and ellipticity a complete characterization of the charge carriers is obtained. In resonator experiments, we observe quantum Hall oscillations at THz frequencies. The 2D density estimated from the period of these oscillations agrees well with direct transport experiments on the topological surface state. The Dirac character of the surface state is proven by the observation of a half-integer plateau in the quantum Hall effect.

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