

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Anomalous galvanomagnetism, cyclotron resonance and microwave spectroscopy of topological insulators¹ EWELINA HANKIEWICZ, GRIGORY TKACHOV, Wuerzburg University — The surface quantum Hall state, magneto-electric phenomena and their connection to axion electrodynamics have been studied intensively for topological insulators. One of the obstacles for observing such effects comes from nonzero conductivity of the bulk. To overcome this obstacle we propose to use an external magnetic field to suppress the conductivity of the bulk carriers. The magnetic field dependence of galvanomagnetic and electromagnetic responses of the whole system shows anomalies due to broken time-reversal symmetry of the surface quantum Hall state, which can be used for its detection. In particular, we find [1] linear bulk dc magnetoresistivity and a quadratic field dependence of the Hall angle, shifted rf cyclotron resonance, nonanalytic microwave transmission coefficient and saturation of the Faraday rotation angle with increasing magnetic field or wave frequency.

[1] G. Tkachov and E. M. Hankiewicz arXiv:1011.2756 (2010)

¹The work was supported by DFG grant HA5893/1-1.

Ewelina Hankiewicz
Wuerzburg University

Date submitted: 14 Dec 2010

Electronic form version 1.4