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**The surface-state of the topological insulator Bi2Se3 revealed by cyclotron resonance** OSCAR AYALA-VALENZUELA, NHMFL, Los Alamos National Laboratory, JAMES G. ANALYTIS, JIUN-HAW CHU, SLAC, Stanford University, MOAZ-M. ALTARAWNEH, NHMFL, Los Alamos National Laboratory, IAN R. FISHER, SLAC, Stanford University, ROSS D. MCDONALD, NHMFL, Los Alamos National Laboratory — Recently, a large number of surface-sensitive probes have reported the existence of Dirac quasiparticles, similar to those reported in graphene, on the surface of single crystals of Bi2Se3 and related compounds. To date transport measurements of TIs have been dominated by the conductivity of the bulk, leading to substantial difficulties in resolving the properties of the surface. To this end, we use high magnetic field, rf- and microwave-spectroscopy to selectively couple to the surface conductivity of Bi2Se3 at high frequency. In the frequency range of a few GHz we observe a crossover from quantum oscillations indicative of a small 3D Fermi surface, to cyclotron resonance indicative of a 2D surface state. The frequency-magnetic field scaling of this resonance is inconsistent with the bulk effective mass, but more consistent with the dispersion and band filling of a Dirac-like surface state as observed by ARPES, with substantial many-body renormalization. Measurements as a function sample thickness aid in separating bulk and surface contributions and indicate that the band filling of the Dirac cone varies from cleave to cleave.

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