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Angular Dependence of Quantum Oscillations in SmB_6 M. HARTSTEIN, B. S. TAN, Y.-T. HSU, University of Cambridge, B. ZENG, NHMFL, M. CIOMAGA HATNEAN, University of Warwick, N. HARRISON, Z. ZHU, LANL, M. KIOURLAPPOU, A. SRIVASTAVA, University of Cambridge, M. D. JOHANNES, Naval Research Laboratory, T. P. MURPHY, J.-H. PARK, L. BALICAS, NHMFL, N. SHITSEVALOVA, National Academy of Sciences of Ukraine, G. G. LONZARICH, University of Cambridge, G. BALAKRISHNAN, University of Warwick, S. E. SEBASTIAN, University of Cambridge — Recent proposals of low-dimensional electronic states in the Kondo insulator, SmB_6 have lead to renewed interest in the material. In this study we present quantum oscillation measurements of high quality single-crystals of SmB_6. Magnetic torque was measured in magnetic fields up to 40 T, allowing the observation of quantum oscillation frequencies ranging from 50 T to 15,000 T in multiple samples prepared by different groups. The size and the angular dependence of the oscillations indicate the striking concurrence of an electronically insulating bulk and a large, bulk Fermi surface. Comparison of the measured oscillations with similar measurements of metallic rare-earth hexaborides supports such a Fermi surface. Our model, previously employed for the metallic hexaborides, describes large ellipsoidally distorted spheres centred at X-points of the Brillouin zone, and smaller ellipsoids positioned at neck points, and gives a good account of the observed frequencies.

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