

Abstract Submitted
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Magnetotransport Measurements on SmB_6 - Cornering the Parameter Space for Carrier Density and Mobility¹ YUN SUK EO, STEVEN WOLGAST, CAGLIYAN KURDAK, KAI SUN, Dept. of Physics, University of Michigan, DAE-JEONG KIM, ZACHARY FISK, Dept. of Physics and Astronomy, University of California, Irvine, MONICA CIOMAGA HATNEAN, GEETHA BALAKRISHNAN, Dept. of Physics, University of Warwick — There is growing interest in studying the conducting surface of SmB_6 , which is believed to originate from its nontrivial band topology. Up to date, different measurement techniques, including ARPES, dHvA, and Hall bar transport still disagree on important parameters such as the carrier density. In order to find the carrier density (n) and mobility (μ) for the Dirac pockets participating in transport, we measure magnetotransport on Corbino devices fabricated on (100), (110), and (111) surfaces grown by floating zone and flux methods. Our samples do not exhibit Shubnikov-de Haas oscillations at high field pulsed measurements up to 90 Tesla, which provides an upper bound of μ of each channels. Also, angle-dependent magnetotransport up to 35 T allows us to extract an effective n and μ of the combined channels. Together, a parameter space that confines the possible n and μ of each channel is constructed, and appears to be in agreement with ARPES reports. Additionally, the effective n and μ change up to 20 percent when applying magnetic field up to 35 T. We will discuss how the Landau fan diagram can be nonlinear by this effect.

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