Abstract Submitted
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Magnetic and Electrical Transport Properties of Dirac Compound $BaMnSb_2$*[1] SILU HUANG, JISUN KIM, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, La 70803, WILLIAM.A SHELTON, Department of Chemical Engineering, Louisiana State University, Baton Rouge, La 70803, WARD PLUMMER, RONGYING JIN, Department of Physics and Astronomy, Louisiana State University, Baton Rouge, La 70803 — $BaMnSb_2$ is a layered compound containing Sb square nets that is theoretically predicted to host Dirac fermions. We have carried out experimental investigations on electrical transport and magnetic properties of $BaMnSb_2$ single crystals. Both in-plane (ρ_{ab}) and c-axis (ρ_c) resistivities show metallic behavior with a small bump in ρ_c located near 40 K, while there is large anisotropy ρ_c / ρ_{ab} (˜100 at 300 K) that increases with decreasing temperature to 1500 at 2 K. Interestingly, Shubnikov-de Hass (SdH) oscillations are observed for both ρ_{ab} and ρ_c over a wide temperature and magnetic field range. Quantitative analysis indicates that large amplitude SdH oscillations result from nearly massless Dirac Fermions. Furthermore, our magnetic measurements indicate an A-type antiferromagnetic magnetic ordering below 286 K where ferromagnetic ordering is observed in the ab plane with antiferromagnetic coupling along the c direction. These results indicate that $BaMnSb_2$ is a 2D magnetic Dirac material.

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