Abstract Submitted
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Magnetotransport study of Dirac fermions in YbMnBi2 and CaMnBi2[1] AIFENG WANG, IGOR ZALIZNYAK, Brookhaven Natl Lab, DAVID GRAF, National High Magnetic Field Laboratory, WEIJUN REN, Institute of Metal Research, KEFENG WANG, LIJUN WU, Brookhaven Natl Lab, OVIDIU GARLEA, Oak Ridge National Laboratory , JOHN WARREN, EMIL BOZIN, YIMEI ZHU, CEDOMIR PETROVIC, Brookhaven Natl Lab — It is well known that $AMnBi_2$ (A = alkaline earth) with two dimensional (2D) bismuth layer host quasi-2D Dirac states similar to graphene and topological insulators. The Dirac state is significantly affected by the alkaline earth in the block layer. Angle-resolved photoemission spectroscopy (ARPES) indicates that $YbMnBi_2$ could be the first Weyl semimetal with time-reversal symmetry breaking, whereas the anisotropic Dirac state in $SrMnBi_2$ can host a valley-polarized interlayer current through magnetic valley control. Here, we study in-plane magnetotransport in $YbMnBi_2$, and interlayer magnetotransport in $CaMnBi_2$. The angular-dependent magnetoresistance, nonzero Berry phase, and small cyclotron mass confirm the presence of Dirac fermion and quasi-2D fermi surface in $YbMnBi_2$. The interlayer electronic transport in $CaMnBi_2$ suggest valley polarized conduction and a Dirac state on the side wall of the warped cylindrical Fermi surface of $CaMnBi_2$.

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