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Anisotropic Magnetoresistance in the Layered Chiral Helimagnet $Cr_{1/3}NbS_2$ ALEXANDER BORNSTEIN, University of Colorado Boulder, NIRMAL GHIMIRE, DAVID MANDRUS, University of Tennessee, Oak Ridge National Laboratory, DAVID PARKER, Oak Ridge National Laboratory, MINHYEA LEE, University of Colorado Boulder — We study the magnetotransport properties and the low temperature specific heat in a highly anisotropic helimagnet $Cr_{1/3}NbS_2$. We compare the dependence of both measurements on field orientation: within the crystallographic plane and normal to it. In transport measurements, the current always remains within the crystallographic ab-plane. We find a three times larger reduction in the resistivity when the magnetization is saturated normal to the plane compared to within the plane. This discrepancy occurs below 50 K $<$ T_C=130 K. In the same temperature range, an unusual field dependence of the Hall Effect is also observed. From first principles calculations, we connect the changes in resistivity to modification of the density of states dependent on the direction of spin polarization. The Sommerfeld constant for both spin orientations is discussed in relation to the transport behavior.

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