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Magnetotransport Properties of the Highly Anisotropic Helimagnet $Cr_{1/3}NbS_2$ ALEXANDER BORNSTEIN, Univ of Colorado - Boulder, NIRMAL GHIMIRE, DAVID MANDRUS, University of Tennessee, Oak Ridge National Laboratory, DAVID PARKER, Oak Ridge National Laboratory, MINHYEA LEE, Univ of Colorado - Boulder — Unusual electrical transports properties such as the topological Hall Effect in non-trivial spin textures have demonstrated great potential for controlling electrical properties via underlying spin degree of freedom. In particular, magnetic systems with no-inversion symmetry in their crystal structure are promising candidates to search for these effects due to their tendency to support non-collinear spin configurations, a requirement for non-trivial spin texture. Here, we study the in-plane magnetotransport properties in the chiral helimagnet $Cr_{1/3}NbS_2$, which falls in such a category and has larger crystalline anisotropy relative to other known systems (e.g. MnSi). At low temperature ($T \ll T_C$), we find that the in-plane magnetoresistance with applied field perpendicular to plane is suppressed up to three times more than with the field in-plane. Concurrently, Hall voltage, which is also taken with B field perpendicular to the plane, displays unique B field dependence. We discuss these results in the light of the role of the anisotropy in $Cr_{1/3}NbS_2$'s magnetic structure and band structure.

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