Linear Magnetoresistance and Anomalous Hall Effect in the Superconductor $NiBi_3$

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Key words: Linear Magnetoresistance, Anomalous Hall Effect, Unconventional Magnetism, Superconductivity.

The $NiBi_3$ compound exhibits a compelling interplay between superconductivity and magnetism, further enriched by topological characteristics that make it an exceptional platform for exploring emergent electronic phenomena.[1,2] Here, we report experimental evidence of unconventional magnetic phenomena in high-quality single crystals of NiBi3, revealed through detailed magnetotransport measurements. The magnetoresistance displays a non-usual temperature dependence, featuring both a classical Lorentz-like component and a linear-in-field contribution. In addition, field-induced anomalous Hall effect signals persist down to the superconducting transition temperature and vanish above 75 K. These observations suggest that magnetic fluctuations play a significant role in charge transport in $NiBi_3$, highlighting a magnetically and topologically intertwined electronic structure. Our findings underscore the complex and multifaceted nature of this material.

Bibliography

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