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Thermomagnetic transport properties of ferromagnetic MnBi STEPHEN BOONA, JOSEPH HEREMANS, Ohio State University — Spin-dependent transport phenomena such as the spin Seebeck effect and magnon drag offer intriguing new possibilities for tuning the thermoelectric properties of magnetically ordered materials. One particularly interesting approach is to examine magnetic materials that are expected to display large intrinsic spin orbit coupling, such as MnBi. In spite of this material's popularity as a candidate for rare-earth free permanent magnets, no studies have been published so far concerning its Seebeck or Nernst coefficients. This talk will discuss our recent measurements of the thermomagnetic properties of high purity polycrystalline MnBi between 2K and 385K and in magnetic fields up to 7T. Our measurements reveal the existence of a substantial anomalous Nernst effect (ANE) from 382K down to the spin reorientation temperature of 90K, while the other transport phenomena show relatively weak magnetic field dependence at all temperatures. We also observe that the Seebeck and ANE coefficients display strikingly similar temperature dependence, with the former peaking at approximately -10 μV/K and the latter at approximately -2.5 μV/K/T, hinting at the important role of spin-dependent processes in determining the transport properties of this material.

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