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Spin transport through native nickel and nickel-iron oxides¹ BARRY ZINK, Univ of Denver, MICHAEL MANNO, University of Minnesota, CEMS, O'BRIEN LIAM, Cambridge University, JOHANNES LOTZE, MATH-IAS WEILER, Walther-Meissner Institute, DEVIN WESENBERG, University of Denver, SEBASTIAN GOENNENWEIN, Technical University Dresden, MELISSA JOHNSON, University of Minnesota, CEMS, ALEX HOJEM, University of Denver, CHRIS LEIGHTON, University of Minnesota, CEMS — Recent reports from our group and others have shown that spin transport is possible through a much wider range of materials than previously thought. These include studies of spin transport, and possible enhancement of spin flow, through very thin nickel oxide and other nominally antiferromagnetic layers inserted between ferromagnets and Pt layers. In this talk we present results of spin transport experiments showing that while the presence of a nonmagnetic oxide at the interface suppresses spin transport from the ferromagnet to the nonmagnetic metal, a thin magnetic oxide (here the native oxide formed on both Py and Ni) enhances the product of the spin-mixing conductance and the spin Hall angle.[1] We also observe clear evidence of an out-of-plane component of magnetic anisotropy in Ni/Pt samples that is enhanced in the presence of the native oxide, resulting in perpendicular exchange bias. The results clarify that spin transport occurs in the oxide despite the lack of long range order at the temperature of the measurements.[1] B. L. Zink et al, PRB v. 93 184401 (2016)

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