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Spin pumping and inverse spin Hall effects in heavy metal/antiferromagnet/Permalloy trilayers[1] HILAL SAGLAM, WEI ZHANG, M. BENJAMIN JUNGFLEISCH, WANJUN JIANG, JOHN E. PEARSON, AXEL HOFFMANN, Argonne National Laboratory — Recent work shows efficient spin transfer via spin waves in insulating antiferromagnets (AFMs) [1], suggesting that AFMs can play a more active role in the manipulation of ferromagnets. We use spin pumping and inverse spin Hall effect experiments on heavy metal (Pt and W)/AFMs/Py ($Ni_{80}Fe_{20}$) trilayer structures, to examine the possible spin transfer phenomenon in metallic AFMs, *i.e.*, FeMn and PdMn. Previous work has studied electronic effects of the spin transport in these materials, yielding short spin diffusion length on the order of 1 nm [2]. However, the work did not examine whether besides diffusive spin transport by the conduction electrons, there are additional spin transport contributions from spin wave excitations [1]. We clearly observe spin transport from the Py spin reservoir to the heavy metal layer through the sandwiched AFMs with thicknesses well above the previously measured spin diffusion lengths, indicating that spin transport by spin waves may lead to non-negligible contributions. [1] H. Wang, et al., Phys. Rev. Lett. **113**, 097202 (2014). [2] W. Zhang et al., Phys. Rev. Lett. **113**, 196602 (2014).

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