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Temperature dependence of the enhanced inverse spin Hall voltage in Pt/Antiferromagnetic/$Y_3Fe_5O_{12}$[1] J. T. BRANGHAM, A. J. LEE, Y. CHENG, S. S. YU, S. R. DUNSIGER, M. R. PAGE, P. C. HAMMEL, F. Y. YANG, Ohio State Univ - Columbus — The generation, propagation, and detection of spin currents are of intense interest in the field of spintronics. Spin current generation by FMR spin pumping using $Y_3Fe_5O_{12}$ (YIG) and spin current detection by the inverse spin Hall effect (ISHE) in metals such as Pt have been well studied. This is due to YIG's exceptionally low damping and insulating behavior and the large spin Hall angle of Pt. Previously, our group showed that the ISHE voltages are significantly enhanced by adding a thin intermediate layer of an antiferromagnet (AFM) between Pt and YIG at room temperature [1, 2]. Recent theoretical work predicts a mechanism for this enhancement as well as the temperature dependence of the ISHE voltages of metal/AFM/YIG trilayers [3]. The predictions show a maximum in the ISHE voltages for these systems near the magnetic phase transition temperature of the AFM. Here we present experimental results showing the temperature dependence for Pt/AFM/YIG structures with various AFMs. 1. H. L. Wang, et. al., Phys. Rev. Lett. 132, 097202 (2014). 2. H. L. Wang, et. al., Phys. Rev. B 91, 220410(R) (2015). 3. R. Khymyn, et. al., Phys. Rev. B 93, 224421 (2016).

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