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Correlation between the direction of exchange bias and spin transfer torque in metallic antiferromagnets/Permalloy bilayers[1] HILAL SAGLAM, Argonne National Laboratory, Illinois Institute of Technology, WEI ZHANG, Oakland University , M. BENJAMIN JUNGFLEISCH, JOHN E. PEARSON, AXEL HOFFMANN, Argonne National Laboratory — Recent work shows that magnetic precession in a ferromagnet (FM) can be excited by spin transfer torque arising from spin Hall effect in metallic antiferromagnets (AF) [1]. However, in these measurements the AF was separated from the FM by a thin copper layer to avoid direct exchange coupling. Here we investigate spin transfer torques in exchange biased systems where a hysteresis loop is shifted relative to the zero-field position due to the exchange interaction between AF and FM [2]. We use spin torque ferromagnetic resonance measurement on AFs/Py ($Ni_{80}Fe_{20}$) bilayers in order to investigate the effect of exchange bias (EB) on spin transfer torques. For that purpose, we perform field-cooling experiments with an applied field parallel and perpendicular to the sample plane and compare the resultant spin Hall conductivities. Interestingly, we observed a unidirectional behavior, where the current induced torques are inequivalent for opposite field directions. [1] W. Zhang *et al.*, Phys. Rev. B **92**, 144405 (2015). [2] J. Sklenar *et al.*, AIP Adv. **6**, 055603 (2016).

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