Correlation between the direction of exchange bias and spin transfer torque in metallic antiferromagnets/Permalloy bilayers\textsuperscript{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) \cite{Zhang}. 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 \cite{Sklenar}. We use spin torque ferromagnetic resonance measurement on AFs/Py (Ni\textsubscript{80}Fe\textsubscript{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. \cite{Zhang,Sklenar}

\textsuperscript{1}Supported by the U.S. Department of Energy (DOE), Office of Science, Materials Sciences and Engineering Division.

Hilal Saglam
Argonne National Laboratory

Date submitted: 11 Nov 2016

Electronic form version 1.4