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Bias-voltage dependence of perpendicular spin transfer torque in asymmetric MgO-based magnetic tunnel junctions S.-C. OH, Samsung Electron., KR, S.-Y. PARK, Korea Basic Sci. Inst., KR, A. MANCHON, M. CHSHIEV, SPINTEC, FR, J.-H. HAN, H.-W. LEE, POSTECH, KR, J.-E. LEE, K.-T. NAM, Samsung Electron., KR, Y. JO, Korea Basic Sci. Inst., KR, Y.-C. KONG, Korea Univ., KR, B. DIENY, SPINTEC, FR, K.-J. LEE, Korea Univ., KR — It has been demonstrated [1] that the magnetic tunnel junction (MTJ) has a sizable perpendicular spin-transfer torque (p-STT), which could substantially affect current-driven magnetization dynamics. In contrast to symmetric MTJs where the bias dependence of p-STT is quadratic [2], it is theoretically predicted that the symmetry breaking of the system causes an extra linear bias dependence [3]. In this talk, we present experimental results that are consistent with the predicted linear bias dependence in asymmetric MTJs [4]. The linear contribution is significant and its sign changes from positive to negative as the asymmetry is modified. This result opens a way to design the bias dependence of the p-STT, which is useful for device applications by allowing, in particular, the suppression of the abnormal switching-back phenomena. [1] I. Theodonis et al. PRL 97, 237208 (2006); C. Heiliger & M. D. Stiles, PRL 100, 186805 (2008). [2] J. C. Sankey et al. Nature Phys. 4, 67 (2008); H. Kubota et al., ibid 4, 37 (2008). [3] J. Xiao, G. E. W. Bauer & A. Brataas, PRB 77, 224419 (2008). [4] S.-C. Oh et al. Nature Phys., published online (2009).

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