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Effects of rf current on critical field for magnetization reversal in spin torque devices WENYU CHEN, SYLVIA FLOREZ, JORDAN KATINE, MATTHEW CAREY, LIESL FOLKS, BRUCE TERRIS, Hitachi Global Storage Technologies — Current induced switching assisted by rf current has recently been observed in spin torque devices at low temperature [1, 2]. This effect allows control of spin transfer induced magnetization reversal through the frequency of an injected rf current. In this study, the effects of the rf current injection on critical field for magnetization reversal in spin valve junctions have been investigated. Measurements were conducted at room temperature, and the magnetic field was applied along the easy axis of the junction. An rf current was injected into the nanojunction at various frequencies ranging between 1 and 20 GHz. The dynamic resistance, dV/dI , was measured as a function of the rf frequency, power and the dc bias current while ramping the magnetic field. The rf current injection was observed to change the critical field for free layer magnetization reversal when the intrinsic spin-transfer-induced dynamics is frequency-locked with the injected rf. The results will be discussed in the context of macrospin models of spin transfer in metallic spin valve structures. [1] S. H. Florez et al. Phys. Rev. B 78, 184403 (2008) [2] Y.-T. Cui et al. Phys. Rev. B 77, 214440 (2008)

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