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Dependence of Gilbert damping on number of bilayers in perpendicularly magnetized Co/Ni multilayers SEE-HUN YANG, WEIFENG ZHANG, IBM Almaden Research Center, HYONSEOK SONG, SUNG-CHUL SHIN, KAIST, Korea, GEORG WOLTERSDORF, University of Regensberg, MARKUS HAERTINGER[1], CHRISTIAN BACK, University of Regensberg, STUART PARKIN, IBM Almaden Research Center — Magnetic materials in which their magnetic moment direction is oriented perpendicular to the plane of the magnetic layers in thin film heterostructures have been much studied for their potential application to spintronic devices. In particular, theories of current induced excitation, via the phenomenon of spin torque transfer, show that perpendicularly magnetized layers can be more easily excited or their magnetization direction switched than in-plane magnetized layers. The current density required for switching is directly proportional to the Gilbert damping within the magnetic layers. We have studied the dependence of Gilbert damping on the number of bilayers in multilayers formed from alternating Co and Ni layers. We compare results from time-resolved, ultrafast pump-probe magneto-optical Kerr effect measurements with those from strip-line and cavity ferromagnetic resonance techniques. We find that the Gilbert damping parameter has a weak dependence on the number of bilayers.

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