Abstract Submitted
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Temperature dependent ferromagnetic relaxation and gyromagnetic ratio in Ni80Fe20/Gd thin films[1] BEHROUZ KHODADADI, JAMILEH MOHAMMADI, CLAUDIA MEWES, TIM MEWES, University of Alabama, TATIANA EGGERS, CASEY MILLER, Rochester Institute of Technology, MINT CENTER TEAM, ROCHESTER INSTITUTE OF TECHNOLOGY TEAM — We report on the temperature dependence of the magnetization dynamics of NiFe thin films (5nm & 10nm) capped with a 3nm Gd layer using broadband ferromagnetic resonance. We observe that the effective Gilbert damping parameter determined from the broadband measurements increases as the temperature approaches the Curie-temperature of the Gd layer. Part of the enhancement can be explained by an increase of the spin-pumping contribution to the relaxation [1,2] as the temperature approaches the Curie temperature of Gd. We also measure a strong increase of the gyromagnetic ratio with decreasing temperature which resembles the increase of the gyromagnetic ratio in rare earth containing transition metals near the compensation point [3,4]. This increase in the gyromagnetic ratio is expected to lead to an increased Gilbert type damping due to spin-orbit interaction [5,6], that likely also contributes to the increase in damping. References: 1. Y. Tserkovnyak et al. Phy. Rev. Lett., 88, 117601-1 (2002). 2. H. Lee et al. J.of. Phys. D, 41, 215001 (2008). 3. W. Ng et al. J. Appl. Phys., 53, 2359 (1982). 4. R.K. Wangsness, Am. J. Phys., 24, 60 (1956). 5. R.J. Elliott, Phys. Rev. 96, 266 (1954). 6. F. Schreiber et al. Solid State Comm. 93, 965 (1995).

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