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Theoretical Investigation of Anisotropic Damping in Exchange Bias Systems[1] ALISON FARRAR, JAMILEH BEIK MOHAMMADI, TIM MEWES, CLAUDIA MEWES, University of Alabama — An accurate description of the magnetization dynamics of exchange bias systems is essential for further development of computer read heads and STT-MRAM. There have been several theoretical predictions of an anisotropic Gilbert damping tensor [1], influenced by the symmetry of the crystal structure, in place of the scalar Gilbert damping parameter in the Landau-Lifshitz-Gilbert equation of motion. However, experimental confirmation is difficult as the anisotropy of the damping parameter is expected to be small for single crystals. We follow up on our experimental discovery of a strong unidirectional contribution to the relaxation of exchange bias systems [2] by implementing an anisotropic damping tensor in our Matlab-based micromagnetics code M3. We present results for a damping tensor with unidirectional anisotropy with respect to the instantaneous orientation of the magnetization. References: 1. K. Gilmore et al. Phy. Rev. B, 81, 174414 (2010) and references therein. 2. T. Mewes et al. IEEE Magn. Lett. 1, 3500204 (2010).

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