Abstract Submitted
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Time-domain diffracted magnetooptic Kerr probing of magnetization dynamics of patterned magnet arrays[1] XIAOBIN ZHU, University of Alberta, FABIAN GIESEN, ZHIGANG LIU, MARK FREEMAN, University of Alberta, HIROYUKI AKINAGA, AIST, Japan — We probe the ultrafast magnetooptic Kerr effect in the diffracted spots of a patterned array of magnets, which serve as diffraction grating. This technique, diffracted MOKE, provides valuable information, as the off-specular spots contain the finite spatial frequencies of the magnetic moment configuration [1-3]. In this talk, we will present the D-MOKE study in the time domain of a 2 μm sized Permalloy square array and a 1 μm sized Permalloy disk array. The time-domain measurements are performed using a time resolved scanning Kerr microscopy in its spectroscopic mode [4]. Due to spatial averaging, we find that time-domain curve shows faster damping compared with individual magnets. We also find that the sensitivity of the Kerr signal is enhanced at the first order. Through Fourier transformation of the time-domain data, and through comparison with micromagnetic simulation, information about magnetic normal modes in individual magnets is extracted. [1] M. Grimsditch, *et al.*, J. Phys.: Condens. Matter **16** R275 (2004); [2] R. Antos, *et al.*, Appl. Phys. Lett., **86**, 231101 (2005); [3] N. Kida, *et al.*, Phys. Rev. Lett. **94**, 077205 (2005). [4] W. K. Hiebert, *et al.*, Phys. Rev. lett.,79, 1134 (1997).

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