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Ferromagnetic Resonance detection using stroboscopic magneto optical Kerr effect SEUNGHA YOON, NIST - Natl Inst of Stds & Tech, and University of Maryland, TAKAHIRO MORIYAMA, NIST - Natl Inst of Stds & Tech, and Kyoto University, ROBERT MCMICHAEL, NIST - Natl Inst of Stds & Tech — Ferromagnetic resonance (FMR) is a powerful method for measuring the magnetic properties of ferromagnets. A number of related optical techniques have become popular, including time-resolved magneto-optical Kerr effect (TR-MOKE) microscopy and Brillouin light scattering (BLS). In this presentation we describe a new, stroboscopic method of measuring FMR based on the magneto-optical Kerr effect (MOKE). We use a polarized telecommunications fiber laser (wavelength = 1550 nm) and a fiber modulator driven at a frequency of interest (1 GHz to 10 GHz) to create pulsed, linearly polarized light incident on a CoFeB thin film sample. Precession in the sample is driven via a coplanar waveguide in the sample holder while the reflected light is split by a polarizing beam splitter and detected by a balanced detector. As the magnetic field is swept, oscillations in the Kerr angle and in the light intensity mix to produce a DC resonance signal. The spectra are Lorentzian, with a superposition of symmetric and anti-symmetric shapes that depends on the phase of the optical and microwave signals. In the presentation, we will also discuss phase sensitive measurements with this technique as well as the advantages over other FMR techniques.

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