Abstract Submitted
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Magneto-optical Kerr Spectroscopy of GaMnAs C. SUN, D. J. HILTON, J. KONO, Rice University, H. MUNEKATA, Tokyo Institute of Technology, L. CYWINSKI, L. J. SHAM, University of California San Diego — We have performed static and dynamic magneto-optical Kerr measurements on ferromagnetic GaMnAs as a function of temperature, magnetic field, and photon energy. The static Kerr angle at zero magnetic field, which exists only below the Curie temperature, is a strong function of photon energy in the probed range (1.5-2.5 eV), exhibiting a sign change around 2.35 eV. We will present detailed comparison of the experimental spectra with theoretical spectra calculated based on an 8-band k.p model. In two-color ultrafast magneto-optical Kerr measurements, we observe ultrafast demagnetization, similar to what we recently reported for InMnAs [1]. The demagnetization signal (i.e., photoinduced decrease in Kerr angle), which decreases with increasing temperature and vanishes at Curie temperature, has two dynamic components: an ultrafast ($\sim$ 1 ps) drop in magnetization is followed by a slower ($\sim$ 100 ps) demagnetization process. The fast component strongly depends on the pump laser fluence. We will discuss how this dynamics changes with the photon energy and polarization of the pump beam, including both above and below band-gap excitation. 1. J. Wang et al., Phys. Rev. Lett. **95**, 167401 (2005).

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