

Abstract Submitted
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Ultrafast Demagnetization Measurements using Extreme Ultraviolet Light: Comparison of Electronic and Magnetic Contributions CHAN LA-O-VORAKIAT, EMRAH TURGUT, CARSON A. TEALE, HENRY C. KAPTEYN, MARGARET M. MURNANE, JILA/University of Colorado, DENIS LVOVSKY, ROMAN ADAM, PATRIK GRYCHTOL, CLAUS M. SCHNEIDER, Peter Grünberg Institute, Jülich, Germany, STEFAN MATHIAS, MARTIN AESCHLIMANN, University of Kaiserslautern and Research Center OPTIMAS, JUSTIN M. SHAW, HANS NEMBACH, THOMAS J. SILVA, National Institute of Standards and Technology — Ultrashort pulses from high-harmonic generation provide new capabilities for uncovering coupled charge, spin, and phonon dynamics in magnetic materials by combining elemental selectivity with ultrafast time resolution in a tabletop source. In this talk, we address an important question in magneto-optics that has implications for understanding femtosecond magnetism: is the signal from the transverse magneto-optical Kerr effect at the M-shell absorption edges of a magnetic material purely magnetic or perturbed by non-magnetic optical artifacts? We conclusively show that high harmonics sensitively probe the magnetic state, with negligible contributions from electronic effects because of hot-electron dynamics. Finally, our measurements are in excellent agreement with conventional visible-wavelength magneto-optics probes and illustrate the power of high harmonics for probing the dynamics in magnetic materials.

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