

Abstract Submitted
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Understanding laser-induced ultrafast demagnetization in ferromagnets: First-principles and two-level model investigation¹ G.P. ZHANG, Department of Physics, Indiana State University, Terre Haute, IN47809, T.F. GEORGE, Office of the Chancellor and Center for Molecular Electronics, University of Missouri-St. Louis, St. Louis, Missouri 63121, T. ANDERSON, W. HÜBNER, Department of Physics, Kaiserslautern University, Germany — Ultrafast demagnetization in ferromagnets attracts lots of attention both experimentally [1] and theoretically [2]. However, up to now, there is no clear understanding whether the observed signal represents a magnetization, while the experimental results are very controversial. In this study, a two-level model is used to simulate the demagnetization process. All the transition matrix elements are computed using the Wien2K code and from bulk nickel. The pump and probe signals and the magnetization for this two level system are computed directly. This should provide insight into the laser-induced ultrafast demagnetization process. [1] E. Beaurepaire *et al*, PRL **76**, 4250 (1996); B. Koopmans *et al*, PRL **85**, 844 (2000); L. H. Andrade *et al*, PRL. **97**, 127401 (2006). [2] G. P. Zhang and Hübner, PRL **85**, 3025 (2000); R. Gomez-Abal, O. Ney, K. Satitkovitchai, and W. Hübner, PRL **92**, 227402 (2004).

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