

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Total angular momentum conservation in laser-induced femtosecond magnetism¹ GUOPING ZHANG, Department of Physics, Indiana State University, Terre Haute, Indiana 47809, YIHUA BAI, Center for Instruction, Research and Teaching, Indiana State University, Terre Haute, Indiana 47809, THOMAS F. GEORGE, Office of the Chancellor and Departments of Chemistry & Biochemistry and Physics & Astronomy University of Missouri-St. Louis — Spin momentum is not a classical quantity [1,2]. It is unclear how the conservation law affects spin momentum change in laser-induced femtosecond magnetization [3]. In solids, the rotational symmetry is lifted by the translational symmetry, and the spin and orbital momenta components of different total angular momenta mix to some extent. This mixing is the origin of the time-dependent total angular momentum in experiments. The remaining unmixed portion accounts for an extra spin change in three independent circularly-polarized laser experiments [4].

[1] G. P. Zhang, Y. Bai, W. Hübner, G. Lefkidis, and T. F. George, *J. Appl. Phys.* **103**, 07B113 (2008). [2] G. P. Zhang and W. Hübner, *Phys. Rev. Lett.* **85**, 3025 (2000). [3] G. P. Zhang, *Phys. Rev. Lett.* **101**, 187203 (2008). [4] G. P. Zhang and T. F. George, *Phys. Rev. B* **78**, 052407 (2008).

¹Supported by DOE under Contract No. DE-FG02-06ER46304, Promising Scholars grant, and NERSC at LBNL under Contract No. DE-AC02-05CH11231.

Guoping Zhang
Department of Physics, Indiana State University, Terre Haute, Indiana 47809

Date submitted: 17 Nov 2008

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