

Abstract Submitted
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Ultrafast time-resolved magneto-optical Kerr study of coherent spin waves in $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ thin films¹ YUHAN REN, Astronomy & Physics, Hunter College, CUNY, DAIMIAN WANG, ROBERTO MERLIN, Physics, The University of Michigan, ADYAM VENIMADHAV, QI LI, Physics, The Pennsylvania State University — We report on ultrafast time-resolved optical measurements on $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ (LCMO) thin films. The differential polarization shows coherent spin wave excitations in LCMO. We determine the magnetic anisotropy and spin stiffness constants from the magnetic-field dependence of the frequency of the spin waves. The gyromagnetic factor, $g \sim 2$, is consistent with the value determined for the 3d electrons of Mn ions. Values of the magnetic bulk anisotropies for all the LCMO samples are in good agreement with those from other techniques [1-2]. Moreover, we observed a high-order spin wave mode in LCMO and its frequency shows strong sample dependence. The results are explained by a possible existence of nanoscale ferromagnetic clusters in LCMO. 1. J. O'Donnel, M. S. Rzhowski, J. N. Eckstein, and I. Bozovic, *Appl. Phys. Lett.* 72, 1775 (1998). 2. C. M. Xiong, J. R. Sun, and B. G. Shen, *Solid State Commun.* 134, 465 (2005).

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