

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Magnons and Phonons Driven out of Equilibrium in a Magnetic Insulator**<sup>1</sup> KYONGMO AN, KEVIN OLSSON, NIKITA KLIMOVICH, Department of Physics, The University of Texas at Austin, SEAN SULLIVAN, ANNIE WEATHERS, LUKE MARSHALL, XI CHEN, JIANSHI ZHOU, LI SHI, Department of Mechanical Engineering, The University of Texas at Austin, XIAOQIN LI, Department of Physics, The University of Texas at Austin — We investigate magnons and phonons in a bulk  $Y_3Fe_5O_{12}$  (YIG) under a large temperature gradient created by laser radiation. YIG is a good playground to study the interaction between phonons and magnons. Because of its absence of itinerant electrons, energy transport is only carried by magnons and phonons. Understanding the coupling between them is a key to the thermally driven spin transport such as Spin Seebeck Effect. We use Brillouin light scattering technique to measure phonon and magnon temperature. We found that they can be driven out of equilibrium under a large temperature gradient. We numerically simulate the phonon and magnon temperatures using two-temperature model. Our results suggest a lower bound of magnon phonon relaxation time in YIG.

<sup>1</sup>We acknowledge support from DOE, AOR under contract W911NF-14-1-0016 and NSF via grant CBET-1336968.

Kyongmo An  
Department of Physics, The University of Texas at Austin

Date submitted: 13 Nov 2014

Electronic form version 1.4