

MAR16-2015-005119

Abstract for an Invited Paper  
for the MAR16 Meeting of  
the American Physical Society

**Large-amplitude spin dynamics driven by a THz pulse in resonance with an electromagnon**

STEVEN JOHNSON, ETH Zurich

With femtosecond time resolution, x-ray diffraction offers unique capabilities to observe directly the dynamics of long range order. When the x-ray energy is tuned near a core-level transition it is possible in many systems to selectively study the dynamics of long-range order of valence properties such as orbital ordering or magnetic spin. Here I discuss how resonantly enhanced magnetic scattering can be used to quantitatively measure the character and magnitude of spin motion in a coherent electromagnon in  $\text{TbMnO}_3$  driven by a THz frequency electromagnetic field. We observe a  $4^\circ$  rotation of the antiferromagnetically ordered spin spiral plane, a result consistent with a previously published model that suggests this may be a viable route for ultrafast domain switching in multiferroics.