Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Enhanced Multiferroicity in $LuFeO_3$ Through Sc Doping[1]
STEVEN DISSELER, NIST Center for Neutron Research, YOON SEOK OH, RONGWEI HU, Department of Physics and Astronomy, Rutgers University, XUAN LUO, Pohong University of Science and Technology, JEFF LYNN, NIST Center for Neutron Research, SANG-WOOK CHEONG, Department of Physics and Astronomy, Rutgers University, WILLIAM RATCLIFF, NIST Center for Neutron Research
— Hexagonal manganites of the type $R\mathrm{MnO}_3$ are well known examples of single-phase multiferroic materials, but suffer from low magnetic ordering temperatures and weak magnetoelectric coupling making them unsuitable for implementation in devices. Recently, the isostructural ferrites $R\mathrm{FeO}_3$ have been proposed as promising materials to exhibit greatly enhanced magnetic properties, including a much stronger coupling mechanism between ferromagnetic moment and ferroelectic polarization. Here we present a magnetometry and neutron scattering investigation of LuFeO_3 forced into the ferroelectric structure through Sc-doping. We find the magnetic ordering temperature dramatically increases relative to pure hexagonal LuFeO_3 and LuMnO_3, as well as an unusual spin-reorientation at low temperatures. We will discuss possible mechanisms for this reorientation and how it provides insight into the enhanced magnetic properties Limit of the $R\mathrm{FeO}_3$ series.

[1]Supported in part by DOE Grant No. DE-FG02-07ER46382

Steven Disseler
NIST Center for Neutron Research

Date submitted: 12 Nov 2014 Electronic form version 1.4