

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

Sorting Category: 06.1 (E)

**Collapse of the Hyperfine Magnetic Field at the Ru site  
in GdRu<sub>2</sub> and HoRu<sub>2</sub>**<sup>1</sup>

D. COFFEY, Buffalo State College, NY 14222, M. DEMARCO, Buffalo State College and SUNY Buffalo, NY 14222, P.-C. HO, California State University, Fresno CA 93740, T. SAYLES, M. B. MAPLE, University of California, San Diego, CA 92093, J. W. LYNN, Q. HUANG, NCCR, Gaithersburg MD 20899 — The Mössbauer Effect (ME) is frequently used to investigate magnetically ordered systems. One usually assumes that the magnetic order induces a hyperfine magnetic field,  $H_{hyper}$ , at the ME active site. This is the case in the ruthenates where the temperature dependences of  $H_{hyper}$  at <sup>99</sup>Ru sites track the magnetic order. This is not the case in GdRu<sub>2</sub> and HoRu<sub>2</sub>. Specific heat, magnetization, and susceptibility show that there is ferromagnetic order below 93K in GdRu<sub>2</sub>. Neutron diffraction data reveal that HoRu<sub>2</sub> orders ferromagnetically at 15.30(4) K with an ordered moment of 7.98(8)  $\mu_B$ . However there is no evidence of a correspondingly large  $H_{hyper}$  in the <sup>99</sup>Ru ME in either material. *Ab initio* calculations shows that spin polarization occurs only on the rare earth sites with  $H_{hyper} < 5T$  on the Ru sites. The results are compared with the corresponding calculations for ferromagnetic SrRuO<sub>3</sub>.

<sup>1</sup>This work is supported by USDOE(DE-FG02-03ER46064) in Buffalo, by RC CCSA #7669 in Fresno, and by USDOE(DE-FG02-04ER46105) and NSF(DMR0802478) in San Diego.

Prefer Oral Session  
 Prefer Poster Session

Dermot Coffey  
coffeyd@buffalostate.edu  
Buffalo State College

Date submitted: 20 Nov 2008

Electronic form version 1.4