

Abstract Submitted  
for the 4CF14 Meeting of  
The American Physical Society

**X-ray Resonant Magnetic Scattering of  $\text{Fe}_3\text{O}_4$  Nanoparticles** DALTON GRINER, YANPING CAI, MATEA TREVINO, KARINE CHESNEL, BYU Physics & Astronomy, ROGER HARRISON, BYU Chemistry, ALEX REID, SLAC Stanford — We are studying the magnetic order in  $\text{Fe}_3\text{O}_4$  nanoparticles assemblies. These particles have a variety of applications, some of the more interesting ones being: drug targeting, cancer therapy, and MRI applications. We have recently (summer 2014) performed a synchrotron experiment at SLAC at Stanford, to measure the X-ray magnetic circular dichroism (XMCD) and the X-ray Resonant Magnetic Scattering (XRMS) signal of nanoparticles we freshly prepared. We used the XMCD signal to extract the spin and orbital magnetic moments in  $\text{Fe}_3\text{O}_4$ . In addition, we used the XRMS patterns to extract a magnetic profile that provides information about the magnetic order in the nanoparticle assembly and its dependency on particle size and concentration.

Dalton Griner  
BYU

Date submitted: 11 Sep 2014

Electronic form version 1.4