

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**A Novel X-ray Diffractometer for the Florida Split Coil 25 Tesla Magnet**<sup>1</sup> SHENGYU WANG, ALEXEY KOVALEV, ALEXEY SUSLOV, THEO SIEGRIST, National High Magnetic Field Laboratory — At National High Magnetic Field Laboratory (NHMFL), we are developing a unique X-ray diffractometer for the 25 Tesla Florida Split Coil Magnet for scattering experiments under extremely high static magnetic fields. The X-ray source is a sealed tube (copper or molybdenum anode), connected to the magnet by an evacuated beam tunnel. The detectors are either an image plate or a silicon drift detector, with the data acquisition system based on LabVIEW. Our preliminary experimental results showed that the performance of the detector electronics and the X-ray generator is reliable in the fringe magnetic fields produced at the highest field of 25 T. Using this diffractometer, we will make measurements on standard samples, such as LaB<sub>6</sub>, Al<sub>2</sub>O<sub>3</sub> and Si, to calibrate the diffraction system. Magnetic samples, such as single crystal HoMnO<sub>3</sub> and stainless steel 301 alloys will be measured subsequently. The addition of X-ray diffraction to the unique split coil magnet will significantly expand the NHMFL experimental capabilities. Therefore, external users will be able to probe spin – lattice interactions at static magnetic fields up to 25T.

<sup>1</sup>This project is supported by NSF-DMR Award No.1257649. NHMFL is supported by NSF Cooperative Agreement No. DMR-1157490, the State of Florida, and the U.S. DoE.

Shengyu Wang  
National High Magnetic Field Laboratory

Date submitted: 14 Nov 2013

Electronic form version 1.4