Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Anisotropy of magnetoresistivities in $Sr_3Ru_2O_7$: Evidence for orbital-dependent metamagnetism[1] D. FOBES, G.C. WANG, Z.Q. MAO, Department of Physics and Engineering Physics, Tulane University, New Orleans, LA — $Sr_3Ru_2O_7$ has been studied extensively due to its rich electronic and magnetic ground state properties, such as its quantum criticality and electronic nematic phase [1,2]. In this talk we will present the results of in-plane angle-resolved directional magnetotransport anisotropy measurements, a technique we used previously to elucidate the orbital-selective nature of the itinerant metamagnetism in $Sr_4Ru_3O_{10}$ [3]. We find that the c-axis magnetoresistivity anisotropy undergoes a drastic change in symmetry from fourfold to twofold through the metamagnetic transition, consistent with the behavior expected for the strong spin polarization. In contrast, the in-plane magnetoresistivity anisotropy remains fourfold through the transition accompanied by only a gradual shift in phase, and only trends towards twofold symmetry at fields well above the transition. These findings suggest the $d_{xz,yz}$ bands, should play a pivotal role in the metamagnetic transition.

[1] S. Grigera *et al.*, Science **294**, 329 (2001)
[2] R. Borzi *et al.*, Science **315**, 214 (2007)
[3] D. Fobes *et al.*, Phys. Rev. B **81**, 172402 (2010)

[1]This work is supported by the NSF under Grant No. DMR-0645305.

David Fobes
Department of Physics and Engineering Physics,
Tulane University, New Orleans, LA

Date submitted: 27 Nov 2011 Electronic form version 1.4