Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Unusual Fermi surface reconstruction driven by moderate magnetic fields in $Sr_4Ru_3O_{10}$ TIJIANG LIU, PRAMOD KUMAR, DAVID FOBES, Tulane University, HUY PHAM, LEONARD SPINU, University of New Orleans, ZHIQIANG MAO, Tulane University — Trilayered ruthenate $Sr_4Ru_3O_{10}$ exhibits puzzling magnetic properties. For field applied along the c-axis it exhibits typical itinerant ferromagnetic (FM) behavior, while moderate field (2-3T) applied within the *ab*-plane can induce a metamagnetic (MM) transition [1]. Such coexistence of ferromagnetism and metamagnetism has been shown to be associated with a multiple band effect; FM bands derived from the d_{xy} orbital coexists with MM bands from the $d_{xz,yz}$ orbitals [2,3]. In this talk, we report on Hall effect studies of this compound. Our results reveal that Fermi surface of $Sr_4Ru_3O_{10}$ changes dramatically through the MM transition. This Fermi surface change leads the Hall resistivity ρ_{xy} to strongly deviate from the scaling relation with magnetization, i.e. $\rho_{xy} = R_0H + 4\pi R_sM$, which holds at fields well below and above the MM transition field. Such a significant change of the FS is unexpected for typical itinerant MM transitions.

[1] Cao *et al.*, Phys. Rev. B 68, 174409 (2003)
[2] J. Jo *et al.*, Phys. Rev. B 75, 094413 (2007)
[3] Fobes *et al.*, unpublished.

Tijiang Liu
Tulane University

Date submitted: 14 Dec 2009 Electronic form version 1.4