Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Magnetic phase separation in double layer ruthenates $\mathbf{Ca_3(Ru_{1-x}Ti_x)_2O_7}$ JIN PENG, Nanjing University, JINYU LIU, JIN HU, ZHIQIANG MAO, Tulane University, XIAOSHAN WU, Nanjing University — Ti doping of a small concentration in the double-layered ruthenate $Ca_3(Ru_{1-x}Ti_x)_2O_7$ was previously found to induce an unusual magnetic phase transition from a metallic antiferromagnetic state formed from anti-parallel stacking of ferromagnetic bilayers (AFM-b) to a nearest-neighbor antiferromagnetic state (G-AFM) with Mott insulating properties; the critical Ti concentration for the transition is near $x = 0.03$. In this article, we conducted systematic studies on this magnetic transition near the critical composition through detailed magnetization measurements. We found that no intermediate magnetic phases exist between AFM-b and G-AFM states; this is contrasted with manganites where a similar magnetic phase transition takes place through the presence of several intermediate magnetic phases. The AFM-b-to-G-AFM transition in $Ca_3(Ru_{1-x}Ti_x)_2O_7$ happens through a phase separation process; the AFM-b and G-AFM phases coexist in the 2-5

Jin Peng
Nanjing University

Date submitted: 03 Nov 2015 Electronic form version 1.4