Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Non-Kondo Mechanism of Resistivity Minimum in Frustrated Itinerant Mangets CRISTIAN BATISTA, T-Division and CNLS, Los Alamos National Laboratory, ZHENTAO WANG, Department of Physics and Astronomy, Rice University, KIPTON BARROS, T-Division and CNLS, Los Alamos National Laboratory, GIA-WEI CHERN, Department of Physics, University of Virginia — Frustration can induce novel phenomena in the transport properties of itinerant magnets. The "amount of frustration" is typically quantified by the $|\Theta_{CW}|/T_C$ ratio. A large value of this ratio corresponds to a broad temperature regime $T_C < T < \Theta_{CW}$, where the spins are in spin liquid state, i.e., the magnetic structure factor is not flat, as in the gas ($T > \Theta_{CW}$) state and it does not contain Bragg peaks, as in the ordered or "solid" state at TT_C. We demonstrate that when interaction between magnetic moments is mediated by the conduction electrons, the electronic resistivity increases upon lowering temperature, due to enhanced scattering rate for $k \leq 2k_F$. To illustrate this phenomenon we consider a triangular Kondo lattice model with classical local moments. By using both analytical and numerical methods, we unambiguously demonstrate that the electronic resistivity grows upon lowering temperature inside the spin liquid regime. This growth necessarily leads to a resistivity minimum when electron-electron and electron-phonon scattering are included. We note that the origin of this resistivity minimum is radically different from the well-known minimum induced by the Kondo effect.

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Date submitted: 05 Nov 2015 Electronic form version 1.4