Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

SDW State Within The Two-Band Model for Iron Pnictides: Role of Hund's Coupling NIMISHA RAGHUVANSHI, AVINASH SINGH, Indian Institute of Technology, Kanpur, India — Following the recent discovery of superconductivity in doped iron pnictides such as $RO_{1-x}F_xFeAs$ (R = La, Ce, Nd, Sm, Gd) and $A_{1-x}B_xFe_2As_2$ (A = Ba, Sr, Ca, B = K, Cs, Na), there has been great interest in their magnetic as well as superconducting state. We have investigated the spin wave excitations and the stability of the (0, π) ordered spin density wave (SDW) state within the minimal two-band (d_{xz} and d_{yz}) model for iron pnictides including a Hund's coupling term. The spin wave dispersion indicates the stability of SDW state in two distinct doping regimes; for finite hole doping in the lower SDW band for small NNN hoppings, and for low electron doping in the upper SDW band for comparable NN and NNN hoppings. Hund's coupling strongly stabilizes the SDW state in both the cases due to the generation of additional ferromagnetic spin couplings involving the inter-orbital part of the particle-hole propagator. The spin wave energies for the two-band model are in agreement with the inelastic neutron scattering studies of iron pnictides and similar to the one-band t-t' Hubbard model results obtained in our earlier work.

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Date submitted: 15 Nov 2013 Electronic form version 1.4