Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Spin-Glass Like Phase in the Weak-Coupling Limit of the Double-Exchange Model[1] RANDY FISHMAN, Oak Ridge National Lab — Recent work has demonstrated that in the weak-coupling or RKKY limit, the double-exchange (or Kondo lattice) model supports a spin-glass like (SGL) phase with short-range but not long-range magnetic order. The magnetic susceptibility and Edwards-Anderson order parameter q of this SGL phase have been evaluated using dynamical mean-field theory (DMFT), which becomes exact in infinite dimensions. We find that q=M(T/T_{SGL})^2, where M is the classical Brillouin function and T_{SGL} is the SGL transition temperature. The correlation length of the SGL phase is determined by a correlation parameter Q that simultaneously maximizes T_{SGL} and minimizes the free energy. The magnetic susceptibility has a cusp at T_{SGL} and reaches a nonzero value as the temperature goes to zero. Analytic results for the SGL phase of a model with classical spins but without quenched disorder and geometric frustration should provide new avenues of investigation into SGL behavior.

[1]Sponsored by Division of Materials Sciences and Engineering, U.S. Department of Energy

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Date submitted: 20 Nov 2006 Electronic form version 1.4