Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Toy model of an electron interacting with two classical spins WILLIAM SCHWALM, JUANA MORENO, Physics Univ. N. Dakota — We consider a single electron governed by a tight-binding Hamiltonian, $H = H^{(o)} + V$, where $H^{(o)}$ stands for the band structure of the crystal and V is a double-exchange type interaction between the electron and two localized classical spins, $\vec{S}_1 \cdot \vec{J} + \vec{S}_2 \cdot \vec{J}$, where $\vec{S}_1$ and $\vec{S}_2$ are classical spins and $\vec{J}$ is electron angular momentum. We study the dynamics of the system as a function of the distance and the angles between the two spins. By summing over electron states we learn about the effective interaction between the two spins. We discuss the connection of this model with ferromagnetism in dilute magnetic semiconductors.

William Schwalm
Physics Univ. N. Dakota

Date submitted: 30 Nov 2005 Electronic form version 1.4