

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Spin relaxation dynamics for an electron gas with localized magnetic impurities near the ferromagnetic transition¹ MATTHEW MOWER, GIOVANNI VIGNALE, University of Missouri — We study the spin relaxation dynamics of electrons in Mn-doped GaAs. Modeling the Mn as magnetic impurities embedded in an electron gas, we construct effective electron-electron and impurity-impurity interactions. This model exhibits a ferromagnetic transition as the temperature is lowered. Near the ferromagnetic transition, strong spin fluctuations cause an enhancement of the electron scattering rate, which affects the spin relaxation time of spin polarized electrons. This is especially notable in the D'yakonov-Perel' spin relaxation time which is proportional to the electron scattering rate. We will elucidate the behavior of the spin relaxation time and other spin-dependent kinetic coefficients near the ferromagnetic transition.

¹Work supported by NSF DMR-0705460 and DOE DE-FG02-05ER46203

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Date submitted: 30 Nov 2010

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