Abstract Submitted
for the SES05 Meeting of
The American Physical Society

Hole Spin Relaxation in Diluted Magnetic Semiconductors[1]
YONGKE SUN, GARY SANDERS, FEDIR KYRYCHENKO, CHRISTOPHER STANTON — We used a generalized Pidgeon-Brown model which incorporates the finite k_z effects and includes the exchange interaction to calculate the band structure of bulk GaAs and GaMnAs. In Fermi's golden rule approximation, the hole spin relaxation in both bulk GaAs and GaMnAs have been studied. Quantitative calculations show that in intrinsic bulk GaAs, the hole spin life time is around 110 fs, which is due to phonon scattering. However, in GaMnAs, $p-d$ exchange interaction and high density of impurities provide the other spin flip scattering channels and dominate. The nonequilibrium spin relaxation time is around several fs.

[1]Work supported by NSF DMR 0325474 .

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Date submitted: 05 Aug 2005 Electronic form version 1.4