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Temperature and doping dependence of spin-flip times in n-GaAs
JOHN COLTON, LEE WIENKES, MICHAEL HEEB, University of Wisconsin-La Crosse — Previously-reported time resolved photoluminescence experiments [1] in lightly-doped n-GaAs have been extended to provide additional measurements of T_1 spin-flip times as a function of temperature and of doping density. The samples studied were MBE-grown 1 micron thick layers of doping densities from 3E14 cm^{-3} to 3E15 cm^{-3}. The technique was to use a pump pulse to inject spin polarized electrons and a probe pulse to read out the polarization at some later time; spin flips caused the polarization to decrease exponentially with pump-probe delay. Some measured T_1 spin-flip times (at low temperature, at low doping densities) were even longer than the previously-reported 1 microsecond value. Work supported by NSF, ACS/PRF, and Research Corporation. [1] J.S. Colton et al., Phys Rev B 69, 121307(R) (2004).

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