Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Spin Lifetime Measurements of GaAsBi Films[1] BRENNAN PURSLEY, Department of Applied Physics, University of Michigan, G. VARDAR, Department of Materials Science and Engineering, University of Michigan, R.S. GOLDMAN, Department of Materials Science and Engineering and Department of Physics, University of Michigan, V. SIH, Department of Physics, University of Michigan — Substituting a small amount of As with Bi, the largest non-radioactive group V element, leads to a large reduction in the GaAs band gap and expected large spin-orbit effects [2]. Both properties are advantageous with potential applications ranging from infrared detectors to spin valves. Compressively strained GaAsBi films with varying bismuth compositions were grown on GaAs using molecular-beam epitaxy. Spin lifetimes were measured using the Hanle effect, a magneto-optical technique where an out-of-plane spin polarization is generated by circularly polarized light and then made to precess about an in-plane magnetic field. A Lorentzian lineshape can be fit to the field-dependent photoluminescence polarization to extract gT_s, where g is the Lande g-factor and T_s is a function of the carrier recombination time and spin dephasing time and provides a lower bound for both. Temperature and power dependent measurements were conducted and our extracted values for gT_s vary from 100ps to 1ns.

[1]We would like to acknowledge NSF Grants DMR-1006835 and ECCS-0844908 and the Fulbright Foreign Student Fellowship.
[2]B. Fluegel et al., **Giant Spin-Orbit Bowing in $GaAs_{1-x}Bi_x$**, Phys. Rev. Lett. **97**, 067205 (2006).

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Date submitted: 16 Dec 2011 Electronic form version 1.4