

Abstract Submitted  
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**Mapping Spin-Orbit Splitting in Strained (In,Ga)As Epilayers**

B.M. NORMAN, C.J. TROWBRIDGE, V. SIH, Department of Physics, University of Michigan, Ann Arbor, MI 48109, J. STEPHENS, A.C. GOSSARD, D.D. AWSCHALOM, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, CA 93106 — Time-resolved and spatially resolved Faraday rotation spectroscopy is used to measure the magnitude and direction of the momentum-dependent spin splitting in strained InGaAs epilayers. The epilayers are lattice-matched to the GaAs substrate and designed to reduce inhomogeneous effects related to strain relaxation. Measurements of momentum-dependent spin splitting as a function of electron spin drift velocity along [100], [010], [110] and  $[1\bar{1}0]$  directions enable separation of isotropic and anisotropic effective magnetic fields that arise from uniaxial and biaxial strain along  $\langle 110 \rangle$ . Such electrically induced effective magnetic fields can be used for spin generation and manipulation in spintronics devices. We find that anisotropic and isotropic strain-induced effective magnetic fields are comparable in magnitude. <sup>1</sup>

<sup>1</sup>B. M. Norman, C. J. Trowbridge, J. Stevens, A. C. Gossard, D. D. Awschalom, and V. Sih, Phys. Rev. B. **82**, 081304(R) (2010).

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