

Abstract Submitted
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Electronic measurement of strain effects on spin transport in silicon¹ LAN QING, HOLLY TINKEY, IAN APPELBAUM, Center for Nanophysics and Advanced Materials and Department of Physics, University of Maryland, College Park, Maryland 20742 — Spin transport in silicon is limited by the Elliott-Yafet spin relaxation mechanism, which is driven by scattering between degenerate conduction band valleys. Mechanical strain along a valley axis partially breaks this degeneracy, and will ultimately quench intervalley spin relaxation for transitions between states on orthogonal axes. Using a custom-designed and constructed strain probe, we study the effects of uniaxial compressive strain along the $\langle 100 \rangle$ direction on ballistic tunnel junction devices used to inject spin-polarized electrons into silicon. The effects of strain-induced valley splitting will be presented and compared to our theoretical model.

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