

Abstract Submitted  
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**Universal scheme for optically-detected  $T_1$  measurements** JOHN COLTON, KEN CLARK, TYLER PARK, DALLAS SMITH, SCOTT THALMAN, Brigham Young University — A two laser pump-probe scheme for measuring spin flip ( $T_1$ ) lifetimes in GaAs-related materials has been developed. The pump and probe beams are switched on and off electronically, with pulse widths and delays controlled by a two-channel pulse generator. The effect of the pump beam on the probe beam is seen by monitoring the Kerr rotation of the reflected probe beam. The technique has broad applicability, and should work for any material in which Kerr rotation spin measurement can be employed. The authors have applied this technique to a lightly-doped GaAs layer ( $n=3E14 \text{ cm}^{-3}$ ), to compare it with two other samples (at slightly higher<sup>1</sup> and slightly lower<sup>2</sup> doping levels) whose  $T_1$  dependence on field had substantial qualitative and quantitative differences from each other. Results for this sample will be presented.

<sup>1</sup>Colton et al., Phys. Rev. B **75**, 205201 (2007).

<sup>2</sup>Fu, et al., Phys. Rev. B **74**, 121304(R) (2006).

John Colton  
Brigham Young University

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