

Abstract Submitted  
for the MAR10 Meeting of  
The American Physical Society

**Spin noise of electrons and holes in self-assembled (In,Ga)As quantum dots** S.A. CROOKER, National High Magnetic Field Lab, Los Alamos, J. BRANDT, C. SANDFORT, A. GREILICH, D.R. YAKOVLEV, M. BAYER, Technische Universitat Dortmund, D. REUTER, A.D. WIECK, Ruhr-Universitat Bochum — We measure the frequency spectra of random spin fluctuations, or “spin noise”, in ensembles of (In,Ga)As/GaAs quantum dots (QDs) at low temperatures [1]. We employ a spin noise spectrometer based on a sensitive optical Faraday rotation magnetometer that is coupled to a digitizer and field-programmable gate array, to measure and average noise spectra from 0-1 GHz continuously in real time (no experimental dead time) with sub-nanoradian/ $\sqrt{\text{Hz}}$  sensitivity. Both electron *and* hole spin fluctuations generate distinct noise peaks, whose shift and broadening with magnetic field directly reveal their  $g$ -factors and dephasing rates within the ensemble. A large, energy-dependent anisotropy of the in-plane hole  $g$ -factor is clearly exposed, reflecting systematic variations in the average QD confinement potential. [1] arXiv:0909.1592

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Date submitted: 12 Jan 2010

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