

Abstract Submitted
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Experimental Measurements of $^{69/71}\text{Ga}$ NMR in Optically-pumped NMR (OPNMR) of AlGaAs/GaAs Quantum Wells¹ SOPHIA HAYES, ERIKA SESTI, DUSTIN WHEELER, MATT WILLMERING, Washington University, RYAN WOOD, CLIFFORD BOWERS, DIPTA SAHA, CHRISTOPHER STANTON, University of Florida, Gainesville — We have conducted photon-energy and helicity-dependent measurements of the ^{69}Ga and ^{71}Ga NMR signals that result from optical pumping of states in the conduction band. The sample we have used for these studies is a 60-well multiple quantum well sample of $\text{Al}_{0.34}\text{Ga}_{0.66}\text{As}/\text{GaAs}$. Our measurements show a particularly strong dependence of the OPNMR signal from the GaAs quantum wells, when irradiating at photon energies consistent with the spin-split light hole within the material. (We use a frequency-stabilized continuous wave Ti:sapphire ring laser, with a very narrow linewidth for these excitation.) The coupling to the light-hole has an important NMR signature which we will discuss in this presentation. We will show results for multiple external magnetic field strengths (B_0) and for different laser light intensities. A thorough understanding of the “fine structure” observed in the photon energy dependence of these OPNMR signals is afforded through theoretical modeling of these results, which will be shown in a separate presentation.

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Sophia Hayes
Washington University

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