Abstract Submitted
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Analysis of Cyclotron Resonance Spectroscopy in a Landau-quantized 2DEG using Characteristic Matrix Methods[1] DAVID HILTON, University of Alabama at Birmingham — We develop a new characteristic matrix-based method to analyze cyclotron resonance experiments in high mobility ($\mu_e = 3.7 \times 10^6$ cm^2 V^{-1} s^{-1}) two-dimensional electron gas samples where direct interference between primary and satellite reflections has previously limited the frequency resolution. We use terahertz time-domain spectroscopy to measure the cyclotron resonance and extract the dephasing lifetime where multiple pulses from the substrate with a separation of ~ 15 ps directly interfere in the time-domain. We find a cyclotron dephasing lifetime of 15.1 ± 0.5 ps at 1.5 K and 5.0 ± 0.5 ps at 75 K.

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