

Abstract Submitted
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The Terahertz Frequency Hall Conductivity of a High-Mobility Two-Dimensional Electron Gas¹ JEREMY CURTIS, JON MOORE, University of Alabama at Birmingham, TAKAHISA T. TOKUMOTO, JUDY CHERIAN, National High Magnetic Field Lab, JUNICHIRO KONO, Rice University, ALEXEY BELYANIN, Texas A&M University, STEPHEN MCGILL, National High Magnetic Field Lab, DAVID HILTON, University of Alabama at Birmingham — We have performed the first measurement of the *terahertz-frequency* complex conductivity tensor of a Landau-quantized high mobility ($10^6 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$) GaAs two-dimensional electron gas. We use polarization-sensitive ultrafast terahertz magnetospectroscopy to resolve the on-axis and off-diagonal Hall conductivity elements. We focus our measurements near cyclotron resonance to determine the line width from 0.4 K to 100 K at ± 1.25 T. This line width decreases monotonically with temperature and does not saturate at the lowest temperatures measured. In this talk, we will develop a model of these data to discuss the relative influence of electron-electron, electron-phonon, and impurity scattering on the temperature dependent sample mobility.

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David Hilton
University of Alabama at Birmingham

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