

Abstract Submitted  
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**A Comparative Study of Cyclotron Decay in Two-dimensional Electron Gas Samples.**<sup>1</sup> B. BARMAN, A.L. OBEIRNE, A.G. LINN, J.A. CURTIS, University of Alabama at Birmingham, J. HOLLEMAN, C. GARCIA, Florida State University, T. TOKUMOTO, University of Alabama at Birmingham, J.L. RENO, Sandia National Laboratory, S.A. MCGILL, National High Magnetic Field Laboratory, D. KARAIKKAJ, University of South Florida, D.J. HILTON, University of Alabama at Birmingham — We used THz time-domain spectroscopy to study cyclotron decay times in high mobility GaAs 2DEGs of varying well widths (30nm and 12 nm). All the measurements were done at a magnetic field of 0.8T as a function of temperature (0.4-10 K). We compare the characteristic cyclotron decay times in both types of samples, as a function of temperature, to examine the influence of surface scattering and strong quantum confinement. Our previous work has shown that the cyclotron decay time exceeds the single particle/quantum lifetime by ~60x in the 30nm 2 DEG QW[1], which we attribute to the influence of small angle scattering in the high-mobility limit  $\mu_{DC}=3.6 \cdot 10^6 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ . [1]Jeremy A. Curtis et al., Physical Review B 93 (15), 155437 (2016).

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