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THz Time-Domain Magneto-spectroscopy of GaAs 2DEG in the 25 T Split-Florida Helix[1] ASHLYN D. BURCH, University of Alabama at Birmingham, J.A. CURTIS, National High Magnetic Field Lab, A.G. LINN, B. BARMAN, M.J. STILES, University of Alabama at Birmingham, J.L. RENO, Sandia National Labs, S.A. MCGILL, National High Magnetic Field Lab, D. KARAISKAJ, University of South Florida, D.J. HILTON, University of Alabama at Birmingham — We have developed a gas plasma based THz time–domain spectrometer (TTDS) coupled with an air-breakdown coherent detection (ABCD) system, to study Landau quantized 2 DEG samples, in the 25 T Split-Florida Helix magnet at the National High Magnetic Field Laboratory (NHMFL). Through the use of non-linear optics, we achieved a larger bandwidth (approx. 0.1-10 THz) compared to traditional fiber-based experimental techniques. We used this system to perform the first high magnetic field TTDS measurements on a high mobility GaAs 2DEG sample. 1. Zhang, et al., Superradiant Decay of Cyclotron Resonance of Two-Dimensional Electron Gases. Physical Review Letters 113, 047601 (2014). 2. T. Arikawa, et al, Terahertz Coherent Control of a Landau-Quantized Two-dimensional Electron Gas, Physical Review B 84, 241307 (2011).

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