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**Cyclotron resonance in the high mobility GaAs/AlGaAs 2D electron system over the microwave, mm-wave, and terahertz- bands** ANNIKA KRIISA, R. L. SAMARWEERA, Dept. of Physics and Astronomy, Georgia State University, M. S. HEIMBECK, Army Aviation Missile RDE Center, Redstone Arsenal, H. O. EVERITT, Dept. of Physics, Duke University and Army Aviation Missile RDE Center, Redstone Arsenal, W. WEGSCHEIDER, Laboratorium fur Festkorperphysik, ETH - Zurich, R. G. MANI, Dept. of Physics and Astronomy, Georgia State University — We have developed a measurement technique that allows measuring the power signal of the microwaves reflected back from the photo-excited high mobility GaAs/AlGaAs 2D device, while simultaneously measuring standard magnetotransport, over the wide frequency range from 30 to 330 GHz. We found that the effective mass extracted from the easily distinguishable peaks observed in the reflected power signal was equal to the cyclotron resonance mass  $0.067m_0$  within the experimental error, over the whole examined frequency range (here  $m_0$  is free electron mass). As expected, the magnetotransport measurements show Shubnikov de Haas oscillations with amplitude changes at cyclotron resonance over the frequency range of 130 to 330 GHz, and the extracted effective mass again equals to the cyclotron resonance mass  $0.067m_0$ . Over the lower frequency range of 30 to 130 GHz, the magnetotransport measurements show microwave radiation-induced magneto-resistance oscillations with a lower effective mass of  $0.062m_0$ . We explore possible explanations to the discrepancies between the observed effective masses.

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