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Study of the correlation between microwave reflection and microwave-induced magnetoresistance oscillations in the GaAs/AlGaAs two dimensional electron system TIANYU YE, R.G. MANI, Georgia State University, W. WEGSCHEIDER, ETH-Zurich

— High frequency microwave illumination produces oscillatory magneto-resistance in the high mobility two dimensional electron systems (2DES) at liquid helium temperatures, in a perpendicular magnetic field. Present theories for this phenomenon include the displacement model and the inelastic model, which have hardly perfectly simulated- or predicted- experimental results such as, for example, the linear microwave polarization dependence of this effect [1]. Besides the usual direct electrical measurement on the 2DES samples, we have examined the microwave reflection to remotely sense the electron-transport in the 2DES, in order to better understand the physical contributions. Here, we compare the concurrently observed direct transport and remotely sensed reflection from the high mobility GaAs/AlGaAs samples under various microwave illumination conditions. Correlated changes between the two types of measurements are reported.

[1] R. G. Mani et al., Phys. Rev. B 84, 085308 (2011); A. N. Ramanayaka et al., Phys. Rev. B 85, 205315 (2012); and references therein.

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