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Microwave radiation-induced magnetoresistance oscillations in the high mobility GaAs/AlGaAs system under bichromatic excitation BINUKA GUNAWARDANA, HAN-CHUN LIU, RASANAGA SAMARAWEERA, Georgia State Univ, WERNER WEGSCHEIDER, ETH Zurich, RAMESH MANI, Georgia State Univ — Bichromatic microwave excitation has been used in atomic physics, for example, to destabilize the populations distribution of cold atoms.[1] In semiconductor physics, bichromatic excitation of the high mobility 2D electron system is thought to provide evidence for current domains in the regime of the microwave radiation-induced zero-resistance states[2-4]. We examined radiation-induced magneto-resistance oscillations under bichromatic excitation over the 30 <f <100 GHz band to obtain a better understanding of the lineshape observed in the dual excitation experiment of the high mobility GaAs/AlGaAs 2D electron system. Thus, we photo-excited the GaAs/AlGaAs Hall bar specimen at liquid helium with one microwave source at a fixed, relatively high frequency and a second microwave source at several lower frequencies corresponding to various frequency ratios. The microwave intensity due to both sources were also changed systematically to study the evolution of the oscillatory magnetoresistance lineshape. Here, we report the results of this study which aims to examine superposition- or lack thereof- in the lineshape observed in the bichromatic experiment. [1]A. Buchleitner, L. Sirko and H. Walther Europhysics Lett. 16, 35 (1991). [2] R. G. Mani et al., Nature, 420, 646 (2002) [3] M. A. Zudov et al., Phys. Rev. Lett. 96, 236804 (2004). [4] X. L. Lei and S. Y. Liu, Appl. Phys. Lett. 89, 182117 (2006).

Binuka Gunawardana
Georgia State Univ

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