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Microwave-Induced Resistance Oscillations in Non-Faraday Configurations KRISTJAN STONE, ZHUOQUAN YUAN, RUI-RUI DU, Rice University, CHANGLI YANG, Institute of Physics, CAS, China, LOREN PFEIFFER, KEN WEST, Bell Laboratories, Alcatel-Lucent — The microwave-induced resistance oscillations (MIRO) are commonly observed in high-mobility GaAs 2D electron systems (2DES), typically using a Faraday configuration. In a Faraday configuration, the electromagnetic components (E_ω and H_ω) coincide with the 2DES plane. We explore MIRO in a microstrip line geometry, in which the dominant excitation component in the 2DES plane is H_ω. Our samples were 100 or 200 μm wide Hall bars of very-high mobility ($\mu > 8 \times 10^6$ cm^2/Vs) GaAs/Al$_x$Ga$_{1-x}$As heterojunctions or quantum wells with electron density ranging from 2.1 - 7.0 $\times 10^{11}$/cm^2. Microwaves from a tunable source (2 GHz - 40 GHz) were fed via a semi-rigid coax cable to the microstrip line over the length of the Hall bar. In a temperature range of 0.3 K – 2.0 K, we observed strong MIRO in all the samples measured. We have studied the fractional MIRO using both the microstrip line and dipole antenna geometries. By increasing the MW power, MIRO features associated with $\varepsilon = 1/2$, 1/3, and 1/4 emerged, where $\varepsilon = \omega/\omega_c$, and ω_c is the cyclotron frequency. Experimental data as well as a brief discussion will be presented. The work at Rice was funded by NSF DMR-0706634.

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