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DC-current induced magneto-oscillations in very high-mobility 2D electron gas C.L. YANG, CHI ZHANG, R.R. DU, Rice University, L.N. PFEIFFER, K.W. WEST, Bell Laboratories, Lucent Technologies — We report on a systematic experimental study of DC-current induced magneto-oscillations [1] using Hall bar samples of very high-mobility (8-20 $\times$ 10^6 cm^2/Vs) GaAs/Al_xGa_{1-x}As heterostructures. Previously we show that remarkable nonlinear resistance and $1/B$ oscillations can arise when a high bias current (I_x) is passed through a Hall bar (width w), and the effect can be explained by a Zener tunneling model in the presence of a tilting Hall field [1]. Data of resistance $R_{xx} \equiv V_x/I_x$, differential resistance $r_{xx} \equiv \partial V_x/\partial I_x$, and $r'_{xx} \equiv \partial r_{xx}/\partial I_x$ in higher mobility samples, which show higher order oscillations, have confirmed the validity of this model. Our temperature dependent date show that this effect can persist to $k_BT > \hbar\omega_c$, where $\hbar\omega_c$ is the cyclotron energy. [1] Yang et al, Phys. Rev. Lett. **89**, 076801 (2002).

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