Abstract Submitted
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Non-linear dc response in microwave-irradiated two-dimensional electron systems: interplay between ac and dc induced effects[1] ANTHONY HATKE, WENHAO ZHANG, MICHAEL ZUDOV, University of Minnesota, LOREN PFEIFFER, KEN WEST, Bell Labs, Alcatel-Lucent — We study nonlinear dc response of a high-mobility two- dimensional electron system subject to microwave (ac) excitation and weak magnetic fields. Recent experiments [1] studied resistance at different dc excitations as a function of the ratio of the microwave frequency to the cyclotron frequency, $\epsilon^{\rm ac}$. Here, we examine oscillations in microwave photoconductivity as a function of dc excitation, at different values of $\epsilon^{\rm ac}$. We find that, for the most part, the oscillation period is the same as in the dark resistivity, and the phase is determined by microwave-induced oscillations at zero dc bias, consistent with the earlier results. However, at some excitation values previously associated with resistance maxima, this approach revealed resistance minima indicating saddle points in the resistivity. We further observed that the oscillation amplitude itself oscillates as a function of $\epsilon^{\rm ac}$, with the oscillations strongly suppressed near half-integral values. These findings indicate the limitations of the simplified resonant condition proposed in Ref. 1 and might stimulate further theoretical studies.
[1] W. Zhang, M.A. Zudov, L.N. Pfeiffer, and K.W. West, Phys. Rev. Lett. **98**, 106804 (2007)

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