

Abstract Submitted  
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**Effect of dc electric field on resonant acoustic phonon scattering in two-dimensional electron systems**<sup>1</sup> WENHAO ZHANG, MICHAEL ZUDOV, University of Minnesota, LOREN PFEIFFER, KEN WEST, Bell Labs, Alcatel-Lucent — We study [1] the effect of dc electric field on transport properties of two-dimensional electron systems in which resonant acoustic phonon scattering dominates linear response resistivity. We observe that dc electric field strongly modifies phonon resonances, transforming resistance maxima into minima and back into maxima. Further, phonon resonances are enhanced dramatically in the non-linear dc response and can be detected even at low temperatures. Most of our observations can be explained by dc-induced (de)tuning of the acoustic phonon resonances and intra-Landau level impurity scattering. We also observe a dc-induced zero-differential resistance state and a resistance maximum which occurs when the electron drift velocity approaches the speed of sound.

[1] W. Zhang, M.A. Zudov, L.N. Pfeiffer, and K.W. West, arXiv:0711.1547v1, Phys. Rev. Lett. (accepted for publication).

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