Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Resonant high harmonic generation in a ballistic graphene transistor with an AC driven gate TOMAS LOFWANDER, YEVGENIY KORNIYENKO, OLEKSII SHEVTSOV, Chalmers University of Technology — We report a theoretical study of time-dependent transport in a ballistic graphene field effect transistor. We develop a model based on Floquet theory describing Dirac electron transmission through a harmonically driven potential barrier. Photon-assisted tunneling results in excitation of quasibound states at the barrier. Under resonance condition, the excitation of the quasibound states leads to promotion of higher-order sidebands and enhanced higher harmonics of the source-drain conductance. The resonances in the main transmission channel are of the Fano form, while they are of the Breit-Wigner form for sidebands. We discuss the possibility of utilizing the resonances in prospective ballistic high-frequency devices, in particular frequency multipliers.

Tomas Lofwander
Chalmers University of Technology

Date submitted: 06 Nov 2015 Electronic form version 1.4