Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Filling-Factor-Dependent Magnetophonon Resonance in Graphene KOSTYANTYN KECHEDZHI, Physics Department, Lancaster University, Lancaster, LA1 4YB, UK, MARK GOERBIG, JEAN-NOEL FUCHS, Laboratorie de Physique des Solides, Univ. Paris-Sud, CNRS UMR 8502, F-91405 Orsay, France, VLADIMIR FALKO, Department of Physics, Lancaster University, Lancaster, LA1 4YB, UK — We describe a peculiar fine structure acquired by the in-plane optical phonon at the Γ-point in graphene when it is brought into resonance with one of the inter-Landau-level transitions in the material. The effect is most pronounced when this lattice mode is in resonance with inter-Landau-level transitions $-, 1 \Rightarrow 0$ and $0 \Rightarrow +, 1$ at a magnetic field $B_0 \approx 30$ T. The predicted mode splitting may be used to measure directly the strength of the electron-phonon coupling, and also to distinguish between circularly (left- and right-hand) polarized lattice modes. A similar effect is predicted in bilayer graphene in lower magnetic fields.

[1] M.O. Goerbig, J.-N. Fuchs, K. Kechedzhi, V. I. Fal'ko, PRL 98, 087402 (2007).

Kostyantyn Kechedzhi
Physics Department, Lancaster University, Lancaster, LA1 4YB, UK

Date submitted: 12 Dec 2007 Electronic form version 1.4