Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

High frequency high magnetic field response of graphene monolayers IVANA PETKOVIC, Laboratoire National de Metrologie et d'Essais, Trappes, France, FRANCIS WILLIAMS, FABIEN PORTIER, PATRICE ROCHE, KEYAN BENNACEUR, CHRISTIAN GLATTLI, Commissariat a l'Energie Atomique, Saclay, France — We study the electronic magnetotransport in graphene at rf frequencies (5-50GHz). Our aim is to investigate the dynamics of charge carriers in the quantum Hall regime. The graphene sample is placed in a break made in a coplanar waveguide and the transmitted power is measured. In order to isolate the response of the sample from the direct transmission between the input and output waveguides, the graphene electron density distribution is modulated with a side gate and the resulting modulation in the transmitted power detected via a standard lock-in technique. The fixed frequency graphene response as a function of magnetic field reveals two different components. One is symmetric in B and dominates under large side gate voltage, and the other shows reproducible fluctuations revealed only at low gate voltage modulation amplitude. The first part is thought to be related to the bulk conductivity and the fluctuations to the carrier dynamics close to the edge. The amplitude of the fluctuations depends on the trajectory of the carriers, since the parity with respect to magnetic field reversal is not conserved. We thus demonstrate the chiral nature of the transport. We assume that the fluctuations of impedance originate in the scattering from localized states close to the sample edge.

Ivana Petkovic
Laboratoire National de Metrologie et d'Essais

Date submitted: 11 Nov 2011 Electronic form version 1.4