

Abstract Submitted
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Microwave transport and noise in graphene devices BERNARD PLACAIS, ANDREAS BETZ, EMILIANO PALLECCHI, GWENDAL FÈVE, JEAN-MARC BERROIR, Ecole Normale Supérieure, CHRISTIAN BENZ, ROMAIN DANNEAU, Karlsruhe Institute of Technology, ANTONELLA CAVANNA, ALI MADOURI, Laboratoire de Photonique et Nanostructures, MESOSCOPIC PHYSICS GROUP TEAM, PHY NANO TEAM, ANR MIGRAQUEL COLLABORATION — We report on microwave transport and noise in graphene sheets, capacitors and transistors. We achieved a transit frequency of 80 GHz in graphene-on-sapphire transistors [1]. This is close to the state-of-the art for a 200nm gate length. In order to investigate electronic diffusion in graphene we have realized 10 GHz bandwidth experiments in metal-oxide-graphene capacitors. The crossover from capacitor to skin-effect limited cavity regimes provides an accurate and direct measurement of the diffusion constant $D(\varepsilon)$. We find D to be energy independent, which points to a mass-disorder scenario [2]. Finally, we have measured the shot noise of CVD graphene in a broad range of bias up to 1V drain-source voltage. In our GHz-frequency measurements we observe a Fano factor exhibiting the three characteristic regimes of electron-impurity, electron-electron and electron-phonon interactions.

[1] E. Pallecchi et al, Appl. Phys. Lett. 99, 113502 (2011)

[2] E. Pallecchi et al, Phys. Rev. B 83, 125408 (2011)

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