Abstract Submitted
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Chiral electron transport in CVD bilayer graphene KYUNGHOON LEE, Department of Electrical Engineering and Computer Science, University of Michigan, YUN SUK EO, CAGLIYAN KURDAK, Randall Laboratory of Physics, University of Michigan, ZHAOHUI ZHONG, Department of Electrical Engineering and Computer Science, University of Michigan — Charge carriers in bilayer graphene have a parabolic energy spectrum. Due to this band structure they are massive quasiparticles having a finite density of state at zero energy like other non-relativistic charge carriers in conventional two dimensional materials. However, they are massive Dirac fermions which have a chiral nature similar to the case of massless Dirac fermions in single layer graphene. Coupling of pseudospin and motion of charge carrier via chirality can result in dramatic consequence for transport in bipolar regime like Klein tunneling, Fabry-Perot interference, collimation of charge carrier, Veslago lens, etc. However, little attention has been paid to chiral dependent electron transport in bilayer graphene. Here we study these properties by probing phase coherent transport behavior in CVD bilayer graphene devices with sub-200nm channel length. Complex Fabry-Perot interference patterns are observed in resonant cavities defined by local gating. By applying Fourier analysis technique, we successfully analyze and identify the origin of each individual interference pattern in bipolar and monopolar regime. Our initial results also hint at the observation of cloaking of electronic states against chiral electrons in bilayer graphene.

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