Abstract Submitted
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Imaging ballistic carrier trajectories in graphene using scanning gate microscopy[1] ZIWEI DOU, University of Cambridge, SEI MORIKAWA, University of Tokyo, SHU-WEI WANG, CHARLES SMITH, University of Cambridge, KENJI WATANABE, TAKASHI TANIGUCHI, National Institute of Materials Science, SATORU MASUBUCHI, TOMOKI MACHIDA, University of Tokyo, MALCOLM CONNOLLY, University of Cambridge — Graphene layers encapsulated by hexagon boron-nitride enable charge carriers to travel ballistically over several microns and provide an opportunity to realise electron optics with Dirac fermions. Scanning gate microscopy is a valuable tool for directly imaging such effects and has recently been applied to investigate coherent scattering in graphene *pnp* junctions [1]. In this work we use SGM to image magnetic focusing of ballistic carriers in a graphene device [2]. By locally varying the carrier concentration and electrostatic potential with the tip we are able to image electrons bouncing from the graphene edges. Moreover, by refocusing misaligned electrons back to collector, our results show how scanning probe tips can be used as mobile lenses for manipulating Dirac fermions in novel device concepts. [1] E.D. Herbschleb, et al., Phys. Rev. B 92, 125414 (2015) [2] S. Morikawa, et al., Appl. Phys. Lett. 107, 243102 (2015); S. Bhandari, et al., arXiv:1510.05197 (2015).

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