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Ballistic Transport in Graphene Antidot Lattices RYUTA YAGI, RYOJI SAKAKIBARA, RYOYA EBISUOKA, JUMPEI ONISHI, Hiroshima University, KENJI WATANABE, TAKASHI TANIGUCHI, National Institute for Material Sciences (NIMS), YASUHIRO IYE, Institute for Solid State Physics, the University of Tokyo — We observed commensurability magnetoresistance arising from ballistic electron transport in the triangular antidot lattice of high-mobility graphene. For both the monolayer and bilayer, magnetoresistance peaks were observed at the commensurability magnetic elds of the cyclotron orbit with antidot lattice. This condition was approximately unchanged for massless and massive Dirac fermions. The peaks appeared when the carrier mean free path was roughly larger than the lattice constant of the antidot, which indicates that the effect stems from the short-range characteristics of the carrier's scattering with antidots. We also found that the magnitude of commensurability peak diminished with changing the gate voltages to the charge neutrality point. This arose from the screening of charged impurity in graphene, which is dependent on carrier density.

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