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Effect of non-uniform magnetic field on Dirac fermions in graphene FEN GUAN, NAOMI MIZUNO, BENT NIELSEN, XU DU, Department of Physics and Astronomy, Stony Brook University — It has been theoretically proposed that non-uniform magnetic field can trigger bound, quasi-bound and scattering states in graphene, while electrostatic barriers cannot serve this purpose due to Klein tunneling. To observe this tuning effect on the transport properties of graphene experimentally, we need high quality graphene and microscopically inhomogeneous magnetic field. Here we report building of the inhomogeneous magnetic field through magnetic vortices in type II superconductor and study the effect of this magnetic field on the transport properties of the Dirac electrons in graphene. We present the fabrication and measurements of suspended graphene over Nb thin films which generate superconducting vortices.

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