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Superconducting Graphene Nanodevices in Ballistic Transport Regime YU-AN CHEN, JOEL I-JAN WANG, Massachusetts Institute of Technology, KENJI WATANABE[1], TAKASHI TANIGUCHI[2], National Institute for Materials Science, PABLO JARILLO-HERRERO, Massachusetts Institute of Technology, PABLO JARILLO-HERRERO'S GROUP TEAM — Superconductivity carried by Dirac fermions can be realized through induced superconductivity in grapheme. Observation of novel phenomena anticipated by theories requires graphene devices with low disorder whereas the carrier transport is ballistic. Current fabrication procedures to make graphene devices with low disorder like suspension or ultra-flat substrates all call for certain kinds of annealing to remove organic residues derived from the fabrication process. Applying these methods to superconducting devices can be challenging since the transparency at the graphene/superconductor interface will be destroyed. Here we present a method to do dry transfer of patterned hexagonal Boron Nitride (hBN) flakes onto graphene. The ultra flatness and lack of dangling bond in the boron nitride substrate reduces the disorder in graphene, and the top layer hBN can protect the graphene from contamination in the nanofabrication procedures and yield the geometry desired for different experimental exploration.

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