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Reducing Carrier Density Pinning at Graphene/Metal Interfaces Using Interfacial Multilayer Graphene AKINOBU KANDA, KENTA KATAKURA, YU ITO, SHINTARO NIHEI, RINEKA HIRAIDE, HIROKAZU TANAKA, YOUITI OOTUKA, HIKARI TOMORI, Division of Physics and TIMS, Faculty of Pure and Applied Sciences, University of Tsukuba — In graphene field effect transistors, as the channel length becomes shorter, the apparent field effect mobility gets smaller. One of the origins of the mobility reduction is carrier injection from metal electrodes (source and drain) to graphene mainly due to the difference in the work function, which makes the carrier density at the interface insensitive to the gate voltage. This carrier density pinning at the interface is unfavorable not only for graphene applications to field effect devices but for the observation of some kinds of Dirac Fermionic behaviors of electrons in graphene, such as specular Andreev reflection at graphene/superconductor interfaces. One of the possible solution for lifting the carrier density pinning is to insert an interfacial layer between the graphene film and electrode metals. Here, we report our attempt to form multilayer graphene at the interface and the observed modulation of the transport property by the interfacial layer.

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