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Characterization of graphene/metal interface and its modification by insertion of thin nano-carbon layer AKINOBU KANDA, KENTA KATAKURA, YU ITO, Faculty of Pure and Applied Sciences and TIMS, University of Tsukuba, YOUITI OOTUKA, Faculty of Pure and Applied Sciences, University of Tsukuba — Due to high mobility and atomic thickness, graphene is a promising candidate for the next-generation electronic material. While considerable effort has been devoted to achieve higher mobility in graphene films, relatively little attention has been paid to the effect of making contact between graphene and metals, which is indispensable to the electric devices. In general, at a graphene/metal interface, mainly due to the difference in work functions, carriers are injected from the metal to graphene. The resulting shift of Dirac point is not limited at the graphene/metal interface but extends by $\sim 1\mu$m into the graphene channel, which affects more significantly the performance of graphene field effect devices with shorter channel. Here, we experimentally investigate the channel length dependence of graphene transport properties and extract the effect of metal contact (i.e., strength of carrier doping). Several metal species are investigated and results are compared with numerical models. Furthermore, we try to reduce the influence of metal contact by inserting a thin nano-carbon film at the interface.

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