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Fermi Velocity Renormalization in Graphene

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Electron-electron interactions bear important information on fundamental electronic properties such as electron effective mass, conductivity, and charge mobility. By using angle-resolved photoemission spectroscopy, here we address unusual electron self-energy in graphene induced by the electron-electron interactions, which are distinguished from those of an ordinary Fermi liquid. Our findings provide a new route for two-dimensional electron systems toward device applications.

Keywords: graphene, ARPES, surface, many-body interactions

S-008

Selective Catalytic Etching of Graphene by SiOx Layer Depletion

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We report catalytic decomposition of few-layer graphene on an Au/SiO_x/Si surface wherein oxygen is supplied by dissociation of the native SiO_x layer at a relatively low temperature of 400 ℃. The detailed chemical evolution of the graphene covered SiO_x/Si surface with and without gold during the catalytic process is investigated using a spatially resolved photoelectron emission method. The oxygen atoms from the native SiO_x layer activate the gold-mediated catalytic decomposition of the entire graphene layer, resulting in the formation of direct contact between the Au and the Si substrate. The notably low contact resistivity found in this system suggests that the catalytic depletion of a SiO_x layer could realize a new way to micromanufacture high-quality electrical contact.

Keywords: graphene, catalytic etching, Scanning photoemission microscopy