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A Scanning Tunneling Microscopy and Spectroscopy Study of K-doped Graphene JEONGHOON HA, HONGWOO BAEK, BEOMYONG HWANG, MINJUN LEE, Department of Physics and Astronomy, Seoul National University, Seoul 151-747, Korea, JUNGSEOK CHAE, Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, Maryland 20899, USA, YOUNG KUK, Department of Physics and Astronomy, Seoul National University, Seoul 151-747, Korea — Understanding the role of impurity scattering is crucial in explaining the carrier transport phenomena in a graphene device. Although unique two-dimensional Dirac fermion behavior have been confirmed by many transport experiments, direct observation of the local electronic structure around impurities may provide detailed picture of carrier scattering. In this study the local electronic structure of potassium deposited graphene film were studied using scanning tunneling microscopy (STM) and spectroscopy (STS). Chemical vapor deposition (CVD) graphene were transferred on a SiO_2 substrate after confirming the thickness and flatness by Raman spectroscopy and atomic force microscopy. STM images show relatively long-range screening around K impurities and the spatially resolved STS revealed unique electronic structure within the screening range. It was found that the screen range varies with the applied back gate bias, suggesting carrier density dependence.

Jeonghoon Ha
Department of Physics and Astronomy,
Seoul National University, Seoul 151-747, Korea

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