

Abstract Submitted  
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**Probing the scattering mechanism in bilayer graphene by changing dielectric constant** SHUDONG XIAO, JIANHAO CHEN, ELLEN WILLIAMS, MICHAEL FUHRER, Center for Nanophysics and Advanced Materials, University of Maryland, College Park, MD 20742-4111, USA — We have examined the charge carrier transport in bilayer graphene in ultra-high vacuum (UHV) at low temperatures while changing the background dielectric constant through deposition of ice overlayers. Bilayer graphene sheets are mechanically exfoliated on Si/SiO<sub>2</sub> substrates, and the number of layers is verified by micro-Raman spectroscopy. We controlled the deposition of ice from water vapor dosage down to the sub-monolayer level and observed the effect on the transport properties of pristine bilayer graphene as well as bilayer graphene with added charged impurities (potassium). Changing dielectric constant has a negligible effect on the charge carrier mobility in pristine bilayer graphene, but significantly increases the mobility in bilayer graphene with adsorbed potassium. The results are consistent with pristine bilayer graphene being dominated by short-range disorder rather than charged impurity scattering.

Shudong Xiao

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