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Scattering in monolayer graphene on SiO_2observed by STS APARNA DESHPANDE, BRIAN LEROY, University of Arizona, WENZHONG BAO, FENG MIAO, CHUN NING LAU, University of California Riverside — The intrinsic ripples in graphene and its distinctive band structure make graphene a novel two dimensional system with intriguing structural and electronic properties. To probe the influence of graphene structure on its electronic properties we have carried out scanning tunneling spectroscopy (STS) measurements on exfoliated graphene on SiO_2 with an ultra high vacuum scanning tunneling microscope (UHV STM) at 4.2 K. Atomically resolved local density of states (LDOS) images show an interference pattern due to scattering. 2D Fourier transforms of the LDOS maps reveal two types of scattering wave vectors corresponding to long range intravalley scattering and short range intervalley scattering. Intervalley scattering due to short range potential variations leads to a $\sqrt{3} \times \sqrt{3}$ R30^o interference pattern in the LDOS while intravalley scattering causes long range disorder in the LDOS images. Our measurements present a comprehensive picture of scattering mechanisms in exfoliated graphene and underline the contribution of random impurities, defects and SiO_2 morphology to the electronic properties of graphene.

Aparna Deshpande
University of Arizona

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