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Using Defects as Local Electronic Probes of Epitaxial Graphene on SiC GREGORY M. RUTTER, KEVIN D. KUBISTA, DAVID L. MILLER, MING RUAN, WALTER A. DE HEER, PHILLIP N. FIRST, School of Physics, Georgia Institute of Technology, Atlanta, GA, JOSEPH A. STROSCIO, Center for Nanoscale Science and Technology, NIST, Gaithersburg, MD — Defects play an important role in the transport properties of epitaxial graphene, and understanding this role is essential for realizing potential nanoelectronics based on graphene. In this study, scanning tunneling microscopy (STM) and scanning tunneling spectroscopy (STS) performed at 4.2 K are used to measure the local electronic behavior of defects in epitaxial graphene grown on both SiC(0001) and SiC(000-1). Energy-resolved maps of the differential conductance reveal defect-induced standing-wave modulations related to the unique nature of the graphene band structure. In this talk, I will discuss how these defects can be used as a local probe of the graphene electronic properties with the inclusion of an applied magnetic field and the resulting Landau quantization. Supported in part by NSF, NRI-INDEX, and the W. M. Keck Foundation.

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