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Direct Observation of Interface States between Single Layer Graphene and SiC* GREGORY RUTTER, TIANBO LI, PHILLIP FIRST, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332, JASON CRAIN, EMILY JARVIS, NATHAN GUISINGER, MARK STILES, JOESPH STROSCIO, Center for Nanoscale Science and Technology, NIST, Gaithersburg, MD 20899 — Graphite films grown on carbon-terminated SiC exhibit coherent transport properties that suggest potential for novel nanoelectronics applications [1]. However, for films grown on silicon-terminated SiC the coherence is greatly reduced, suggesting that the interface electronic structure influences the transport [1]. We have investigated the interface structure and electronic states that form in single layer graphene grown on silicon terminated SiC, using scanning tunneling microscopy and spectroscopy measurements at 4 K. Imaging a single graphene layer reveals features of both the graphite structure and the SiC interface. Which structure dominates is observed to be a function of the imaging bias. Sharp peaks in the density of states were found over SiC interface features, which correspond to the onset voltages observed in topography measurements. A comparison of experimental and theoretical findings will be discussed including relevance to transport measurements. *This work is supported in part by the Office of Naval Research and NSF. [1] C. Berger et al., Science 312, 1191 (2006); J. Phys. Chem. B 108, 19912 (2004).

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