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Scanning Tunneling Potentiometry Mapping of Electron Transport in Graphene on SiC[1] KENDAL CLARK, SHENGYONG QIN, XIAOGUANG ZHANG, Oak Ridge National Laboratory, GUOWEI HE, Carnegie Mellon University, GONG GU, University of Tennessee, RANDALL FEENSTRA, Carnegie Mellon University, AN-PING LI, Oak Ridge National Laboratory — Single layers of graphene formed on SiC look to be a promising system for the realization of graphene electronics. To utilize the full potential of graphene on SiC a complete understanding of the physical and electronic properties of this system is needed. Scanning Tunneling Microscope (STM) images along with scanning tunneling spectroscopy is used to characterize the sample surface. STM images clearly show the distinction between 1 monolayer (ML) and 2ML regions and this transition is further confirmed by point spectroscopy and spectroscopic mapping across the boundary. Defects, grain boundaries, step edges and other potential scattering centers are thought to play a major role in the electronic properties, especially in transport, along the graphene sheets. Using a low temperature four-probe scanning tunneling microscope, potentiometry measurements are performed on the epitaxial graphene grown on 4H-SiC. Potentiometry maps spanning the transition from 1ML to 2ML graphene show a contrast change indicating a potential change at this interface. Preliminary results of the transport along this potentially revolutionary new electronic system will be presented.

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