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Scanning Tunneling Microscopy of Graphene on Single Crystal Copper Surface LI GAO, MATTHIAS BODE, JEFFREY GUEST, NATHAN GUISINGER, Center for Nanoscale Materials, Argonne National Laboratory — Graphene is a monolayer of carbon atoms tightly packed into a nearly ideal two-dimensional hexagonal lattice. Graphene is a promising electronic material because of its distinctive band structure and physical properties. Large-area synthesis of high-quality graphene is one of the main obstacles towards fabricating graphene devices. Recently, large area graphene with high electrical quality has been realized on copper foils. Copper has demonstrated its advantage in fabricating high-quality uniform graphene monolayer. In this talk, we will present our studies of graphene on single crystal copper surface by variable temperature scanning tunneling microscopy and spectroscopy. We studied the bonding configurations between copper and carbon, as well as the atomic-scale electronic structure of the graphene on the copper surface. Our results provide valuable information for understanding the growth mechanism and the electronic quality of graphene on copper.

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