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Imaging Electronic Interference Effects in Ultrathin Epitaxial Graphite[1] JASON CRAIN, Center for Nanoscale Science and Technology, NIST, Gaithersburg, MD 20899-8412, USA, GREGORY RUTTER, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332, JOSEPH STROSCIO, Center for Nanoscale Science and Technology, NIST, Gaithersburg, MD 20899-8412, USA, TIANBO LI, PHILLIP FIRST, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332 — We have used scanning tunneling microscopy and spectroscopy at 4K to investigate local fluctuations in the electronic structure of ultrathin epitaxial graphite grown on SiC. Spectroscopic maps of the density of states for two- and three-layer films reveal spatial modulations that fluctuate with energy. These maps show short range root three by root three ordering reminiscent of Bloch wave interference observed in finite carbon nanotube segments [1]. Additional long range fluctuations have a characteristic length scale that may be related to the underlying structure of the SiC interface.
[1] S. G. Lemay et al., Nature 412, 617 (2001).

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