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Imaging stacking faults in epitaxial graphene/buffer layer structures on SiC(0001) PATRICK MENDE, GUOWEI HE, RANDALL FEENSTRA, MICHAEL WIDOM, Dept. Physics, Carnegie Mellon University, Pittsburgh, PA, IRENE CALIZO, GUANGJUN CHENG, RANDOLPH ELMQUIST, ANGELA HIGHT WALKER, National Institute of Standards and Technology, Gaithersburg, MD, MARIANO REAL, Instituto Nacional de Technología Industrial, San Martín, Buenos Aires, Argentina — In characterizing the structure of epitaxial graphene on SiC, the homogeneity of the number of monolayers (MLs) of graphene on the surface is important due to its substantial effect on graphene's electronic properties and, until recently, was not easily controlled. As the processing of samples continues to improve, other structural properties of the films and substrate (e.g., substrate morphology, step density, and grain area) have become important in the pursuit of improved electronic behavior. In this talk, imaging of rotational stacking faults in epitaxial graphene on SiC(0001) using low-energy electron microscopy (LEEM) is described. Using a pattern of fiducial marks on the SiC surface, we have correlated LEEM imaging of these stacking faults with micro-Raman imaging. Additionally, while stacking domains in $\geq$1ML graphene have been studied previously in LEEM [1-2], here we introduce first-principles calculations of low-energy electron reflectivity for various stacking arrangements of 1ML graphene/buffer- layer structures on SiC(0001), and compare these predictions to the reflectivity seen in LEEM.

[1] C. Virojanadara et al., Surface Science 603, L87 (2009).
[2] Hibinio et al., PRB 80, 085406 (2009).

Patrick Mende
Dept. Physics, Carnegie Mellon University, Pittsburgh, PA

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