

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Inhomogeneous strain fields in epitaxial graphene¹ DIEDRICH A. SCHMIDT, Ruhr-University Bochum Dept. Physical Chemistry II, TAISUKE OHTA, LAURA B. BIEDERMANN, THOMAS E. BEECHEM, STEPHEN W. HOWELL, GARY L. KELLOGG, Sandia National Laboratories — We report a large, inhomogeneous in-plane compressive strain (up to 0.5%) and its local variation at micrometer length scales in single layer graphene films on silicon carbide (SiC) (0001). The strain, due to the difference in lattice constants and thermal expansion coefficients of graphene and SiC substrate, is probed using Raman scattering and low energy electron diffraction. We show that both the growth mechanism and the relaxation along the mismatched symmetry of the graphene and underlying substrate can affect the exact amount of local strain. The large compressive strain implies that monolayer graphene is tightly grafted to the underlying interface layer and SiC substrate; otherwise it would delaminate to relieve the strain. The magnitudes of the structural strain and its local variation are significant and need to be taken into account for electronics applications of the graphene-SiC(0001) system.

¹This work was supported by BMBF grants 05KS7PC2 and 05K10PCA, the LDRD program at SNL, and the US DOE Office of Basic Energy Sciences' Division of Materials Science and Engineering (Contract No. DE-AC04-94AL85000).

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Date submitted: 18 Oct 2010

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