

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Spectromicroscopy measurements of surface morphology and band structure of exfoliated graphene KEVIN KNOX, ANDREA LOCATELLI, Elettra Synchrotron, Trieste, Italy, DEAN CVETKO, University of Ljubljana, TEVFIK MENTES, MIGUEL NINO, Elettra Synchrotron, Trieste, Italy, SHANCAI WANG, Renmin University of China, MEHMET YILMAZ, Fatih University, Istanbul, Turkey, PHILIP KIM, RICHARD OSGOOD, Columbia University, ALBERTO MORGANTE, TASC National Laboratory, Trieste, Italy — Monolayer-thick crystals, such as graphene, are an area of intense interest in condensed matter research. However, crystal deformations in these 2D systems are known to adversely affect conductivity and increase local chemical reactivity. Additionally, surface roughness in graphene complicates band-mapping and limits resolution in techniques such as angle resolved photoemission spectroscopy (ARPES), the theory of which was developed for atomically flat surfaces. Thus, an understanding of the surface morphology of graphene is essential to making high quality devices and important for interpreting ARPES results. In this talk, we will describe a non-invasive approach to examining the corrugation in exfoliated graphene using a combination of low energy electron microscopy (LEEM) and micro-spot low energy electron diffraction (LEED). We will also describe how such knowledge of surface roughness can be used in the analysis of ARPES data to improve resolution and extract useful information about the band-structure.

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Date submitted: 28 Nov 2010

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