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Electron Diffraction and Imaging Measurements of the Morphology of Suspended and Supported Graphene KEVIN KNOX, Columbia University, 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, PHILIP KIM, RICHARD OSGOOD, Columbia University, ALBERTO MORGANTE, TASC National Laboratory, Trieste, Italy — Crystal deformations in graphene are known to adversely affect conductivity and increase local chemical reactivity. Thus, an understanding of the surface morphology of graphene is essential to making high quality devices. The morphology of supported graphene has been extensively studied with STM and AFM. However, since these techniques are accompanied by the application of elastic forces they cannot be extended to suspended graphene. In this talk, we will describe a non-invasive approach to examine the corrugation in suspended and supported exfoliated graphene using a combination of low energy electron microscopy (LEEM) and micro-spot low energy electron diffraction (LEED). LEEM measurements allow real space imaging of surface features above 10 nm. A careful analysis of LEED measurements reveals details of surface morphology down to interatomic distances. Thus, by combining these two probes we are able to access both the microscopic and mesoscopic regimes to obtain a full characterization of the corrugation in graphene.

Kevin Knox
Columbia University

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