Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

SPM measurements of graphene corrugation and spatial correlation[1] WILLIAM CULLEN, JIANHAO CHEN, University of Maryland, MASA ISHIGAMI, University of Central Florida, ELLEN WILLIAMS, MICHAEL FUHRER, University of Maryland — In order to determine the effect of graphene corrugation on electronic transport, it is most important to know the spatial correlation properties of the corrugated graphene structure. In spite of much experimental effort, there is still contentious debate about the structure of graphene, both in supported and suspended geometries. It has frequently been asserted that a graphene monolayer exfoliated onto a SiO2 substrate may display "intrinsic" corrugation – rippled structure which is not derived from the topography of the underlying substrate. Here, we report recent UHV NC-AFM and STM results which show that anomalous corrugation may be observed due to local interaction between the tip and the graphene monolayer. Our results show that non-perturbative NC-AFM measurement reveals a graphene topography which is as smooth as the underlying SiO2, with height-height correlation exponent 2H = 1. STM measurement of graphene, due to uncontrolled tip-sample forces, may exhibit anomalous corrugation depending on tip condition.

[1]Supported by a NRI supplement to the UMD-NSF-MRSEC grant #DMR 0520471.

William Cullen
University of Maryland

Date submitted: 25 Nov 2008 Electronic form version 1.4