Abstract Submitted
for the PSF09 Meeting of
The American Physical Society

Mechanical Deformation of Single- and Few- Layer Graphene on Micro-Scale-Grooved PDMS[1] DAVID ROCKLIN, SCOTT SCHARFENBERG, CESAR CHIALVO, RICHARD WEAVER, PAUL GOLDBART, NADYA MASON, University of Illinois at Urbana -Champaign — The physical properties of the material graphene are currently of wide interest. To explore their mechanical aspects, we placed graphene flakes, of thicknesses ranging from one to seven layers, on a rubbery PDMS (polydimethylsiloxane) substrate containing microgrooves. We used Atomic Force Microscopy (AFM) imaging techniques to study the resulting deformations of the surface, and found that the graphene adhered to the sample and substantially flattened the profile of the grooves. We have examined this flattening effect within a model based on linear elasticity theory. Thus, we have been able to identify, at least tentatively, the point at which shear stress breaks the interlayer coupling and causes the graphene layers to slide against each other.

[1]This work was supported by the DOE-DMS under Award No. DE-FG02-07ER46453, through the Materials Research Laboratory and Center for Microanalysis of Materials (DE-FG02-07ER46453) at UIUC and by the NSF under Award No. DMR-0644674.

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Date submitted: 05 Nov 2009 Electronic form version 1.4