Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

New Experimental Determination of Topology for Two-Dimensional Nanostructured Polymers PETER BEAUCAGE, Cornell University, GREGORY BEAUCAGE, University of Cincinnati — In recent years, considerable interest in the unique structure and properties of graphene has expanded to include a wide variety of other inorganic and organic two-dimensional materials including molybdenum disulfide, tungsten oxide, polyfullerene networks, synthetic two-dimensional polymers, and biological membranes, among others. We have previously developed a fractal scaling model to describe the structure of a crumpled two-dimensional sheet in solution and applied it to characterization of crumpling behavior of graphene in solution, with the capability to statistically quantify the mole fraction degree of crumpling and lead to the effective projected area of the structure, which is useful for the Helfrich dynamic models. Recent efforts have focused on applying this model to characterization of a wide variety of polymeric materials, ultimately moving toward *in situ* methods for elucidation of structure-processing-property relationships in 2D polymers and other materials.

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Date submitted: 15 Nov 2013 Electronic form version 1.4