Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Model system to study polymer folding in poor solvents BEN BAMMES, JEFFREY OLAFSEN, Department of Physics & Astronomy, University of Kansas — The dynamics of a chain of stainless steel monomers partially submerged in a thin layer of water that is vertically oscillated on a horizontal plate have been observed to be visually similar to that of polymer collapse in a poor solvent.[1] In this experiment, the model 'polymer' is composed of 25 to 250 loosely connected spheres that allows the chain to bend but also limits the smallest circle into which the chain can be folded (a persistence length). The surface tension plays the role of the long-ranged potential that is minimized during the folding process and the surface excitations of the thin fluid layer play the role of the Brownian noise that drives the system stochastically. In addition to the folding of a single chain, we examine the interactions between multiple chains to better detail the total potential that is minimized in the folding process. We are attempting to model the folding in this 2D system using a Langevin equation to describe the dynamic evolution. Once a simulation can be built to using this 2D model, it can be generalized to predict folding in 3D. This system is advantageous for studying polymer folding in poor solvents in the absence of many of the electrical and chemical details in real polymers.

[1]B. Bammes and J. S. Olafsen, Chaos, **14**, S9 (2004).

Jeffrey Olafsen
Department of Physics & Astronomy, University of Kansas

Date submitted: 11 Aug 2005 Electronic form version 1.4