Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Folding by Design[1] PAUL DODD, Department of Chemical Engineering, University of Michigan, PABLO DAMASCENO, Applied Physics Program, University of Michigan, SHARON GLOTZER, Department of Chemical Engineering, University of Michigan — A form of self-assembly, "self-folding" presents an alternative approach to the creation of reconfigurable, responsive materials with applications ranging from robotics to drug design. However, the complexity of interactions present in biological and engineered systems that undergo folding makes it challenging to isolate the main factors controlling their assembly and dis-assembly. Here we use computer simulations of simple, minimalistic self-foldable structures and investigate their stochastic folding process. By dynamically accessing all the states that lead to, or inhibit, successful folding, we show that the mechanisms by which general stochastic systems can achieve their "native" structures can be identified and used to design rules for optimized folding propensity.

[1]Research supported by the National Science Foundation, Emerging Frontiers in Research and Innovation Award # EFRI-1240264.

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Date submitted: 15 Nov 2013 Electronic form version 1.4