

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

The Entropic Rigidity of Circular Polymers MARTIN BERTRAND,
MARTIN FORGET, BÉLA JOÓS, University of Ottawa — Thermal energy provides random motion to particles that leads to the well-known entropic force which favours the clumping of linear and circular molecules. We evaluate the entropic force which resists the radial dilation and subsequent twisting of circular polymers by developing mechanical models and performing molecular dynamics simulations. We find that dilating a looped chain is analogous to stretching its linear counterpart. We also find that the torque applied to an already dilated ring and the resulting twist are related by a linear relationship for a wide range of deformed configurations and, using this result, we can predict the angular fluctuations of such a macromolecule.

Martin Bertrand
University of Ottawa

Date submitted: 20 Nov 2009

Electronic form version 1.4