

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.

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Date submitted: 20 Nov 2009

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