

Abstract Submitted
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An Analytic Theory for Single Molecule Manipulation of DNA¹

CRISTIANO NISOLI, Theoretical Division and CNLS Los Alamos National Laboratory, Los Alamos NM — We introduce a minimal, analytically solvable model for thermomechanical behavior of DNA under tension and torque, and predict critical temperature for denaturation at unwinding and overwinding, phase diagrams for stable b-DNA, and supercoiling-elongation curves as functions of applied torque, tension and temperature. Our results are in agreement with experimental data from experiments in single molecule manipulation. We also propose simple thermodynamical formulae for temperature, tension, torque, and supercoiling at criticality.

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