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DNA conformation and dynamics in quasi-2D and -1D confinement YENG-LONG CHEN, Institute of Physics, Academia Sinica — We investigate the structure and correlation length of DNA molecules in sub-100nm quasi-2D slits and 1D square channels. In strong slit confinement, the segmental correlation length of DNA molecules separates into two components – in the confined and unconfined dimensions. In the confined dimension, the segmental correlation length is controlled by the slit height. In the unconfined dimension, the segmental correlation length increases as the slit height decreases. In the nano-channel, segmental correlation length increases beyond the chain contour length as channel height decreases below channel persistence length. We generalize how this affects the entropic elasticity of confined DNA molecules and how it affects chain thermodynamic properties.

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