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Dynamical properties of DNA under confinement SATHEESH KUMAR, WOKYUNG SUNG, Department of Physics, Pohang University of Science and Technology, Pohang 790-784, South Korea — The recent advances in experimental techniques of single molecule manipulation have attracted remarkable interests in the structure and dynamics of polymers under confinement. In this work we develop a computational scheme, based on Brownian dynamics, to systematically incorporate the effect of the confining geometry on hydrodynamic interactions between the polymer segments. In this scheme the surface of the confining geometry is treated as a collection of beads in the same way as the well-known bead-spring chain represents a polymer molecule so that we can consider the hydrodynamic interactions among the segments of the polymer as well as between the polymer and wall in a unified manner. One of significant advantages of this method is the possibility of considering fluctuating boundaries which may be relevant in many biological situations. The dynamical properties such as relaxation time of DNA confined within a channel are computed and compared with the existing results.

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