Abstract

Bead-rod model are frequently used in both numerical and theoretical studies of polymers due to a fixed contour length and its intuitive properties. Brownian dynamics (BD) simulations is one of the most important methods in the study of bead-rod systems when applied to complex processes, such as DNA movement in a cell. Here, we present a numerical study of the ring polymer driven by an external force acting on a single bead. A system of several polymer loops linked and pulled at the same single spot models the process of chromosome arrangement during meiosis. Our simulations provide a quantitative way to investigate the contact dynamics of the homologous chromosomes and therefore better understand the physical mechanisms underlying the process of recombination.

Brownian dynamics simulation of bead-rod rings models chromosome movements in fission yeast

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