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Dynamics of a linear polymer in a microchannel creeping flow¹

PRASENJIT BOSE, MIRON KAUFMAN, PETRU FODOR, Cleveland State University — An understanding of the dynamics of a polymer in a microchannel could be used to design the technology for high throughput molecular analysis and manipulation. We simulate the motion of a linear polymer advected by a fluid in a rectangular microchannel. We consider the creeping laminar flow, i. e. zero Reynolds number. The model polymer is made up of beads connected by elastic springs. The dynamics of this nonlinear mechanical system is studied as a function of model parameters: the spring equilibrium distance, the mass of a bead, and the spring constant.

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