

Monte Carlo simulations of circular supercoiled polymers

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1 Intersections

To prevent

We define two

$$\vec{r}_1 = \vec{r}_0 + \delta_1 \hat{t}_1 \tag{1}$$

$$\vec{u}_1 = \vec{u}_0 + \delta_2 \hat{t}_2 \tag{2}$$

The distance between the two lines is then $d(\vec{r}_1, \vec{r}_2) = \|\vec{r}_1 - \vec{r}_2\|$. We then look for the δ_i minimizing d ,

$$\begin{aligned} \frac{\partial d(\vec{r}_1, \vec{r}_2)}{\partial \delta_1} &= 0 \\ \frac{\partial d(\vec{r}_1, \vec{r}_2)}{\partial \delta_2} &= 0, \end{aligned} \tag{3}$$

2 Knots