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Discrete inextensible polymer chain models

We present a physics of polymer chains. Two cases of a discrete inextensible chain are considered. In the first case the chain is composed by N beads of mass m connected together by $N-1$ weightless links of a constant length a, while in the second case one considers a chain composed by N bars of mass m and fixed length a jointed at their ends. The constraints which provide non-extensibility of chain are imposed in the level of a Langevin equation (J. T. Waldron *et al.*, 1996), which describes the particles in stochastic motions, and with help of potentials in the generating functional Z describing dynamics of a chain. The generating functional giving the same result for this two form of a chain in the continuous limit, where the number of beads or bars N is going to infinity and the length of a bar or a link a is going to zero, is presented with the help of a path integral formulation (F. Ferrari *et al.*, *Phys. Rev. E*, 2008). The Dirac delta function is used as a potential to impose the constraints in the level of generating functional is presented.