



سمینار هفتگی گروه ماده چگال نرم

Asymmetric Elastic Rod Model for DNA

Behrouz Eslami

Physics Department
Sahrif University

Characterizing the elastic behaviour of the DNA molecule is of crucial importance in understanding its biological functions. In recent years, single-molecule experiments such as DNA stretching and cyclization have provided us with valuable information about the elasticity of long DNA molecules.

The results of these experiments can be described by the elastic rod model (also called wormlikechain model). The elastic rod model is very successful in explaining the elastic behaviour of the micron-size DNA molecules.

Recently, modern experimental techniques have made it possible to study the elasticity of DNA at nanometer length scale. In these experiments it is observed that short DNA molecules are much more flexible than predicted by the elastic rod model.

The model which I am going to introduce in this talk takes into account the unharmonic corrections to the elastic rod model. In this model it is assumed that the energy required to bend the DNA over its major groove is not equal to the energy required to bend it over its minor grooves. This assumption is justified since the DNA is not a symmetric molecule, it has a large major groove and a small minor groove.

It will be shown that this asymmetric elastic rod model can account for the high flexibility of short DNA molecules.

زمان: شنبه ۸۷/۱۲/۲۴ ، ساعت : ۱۵:۳۰

مکان: آمفی تئاتر دانشکده فیزیک

قطب ماده چگال و سیستم‌های پیچیده