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Topological solitons in DNA with modified potential

E Behjat and N Riazi

Department of Physics, Shiraz University, Shiraz 71454, Iran

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Abstract

DNA is not only an essential research subject for biologists, but also it raises very interesting questions for physicists. The open states in DNA double helix can lead to topological solitons. Since DNA is a very long molecule (of order a meter or so long) and nano-scale width, solitons can propagate along the molecule. In this paper, considering a correction term in the interaction potential between two chains, we study the dispersion relation analytically, and obtain the soliton solutions using a new relaxation method. Then we compare our solutions and its energy with those obtained by others without the proposed correction term.

Keywords: DNA dynamics, nonlinear physics, topological solitons

For the full article refer to the Persian section