

Investigation of the possibility of solitary waves in the base stacks of DNA. Ladik J;
Hofmann D; Forner W; Otto P

Abstract

The possibility of the existence of solitary waves in DNA is investigated. On the basis of our classical model we do not find such a wave in a polynucleotide, but for a stack of adenine molecules without backbone we observe one. Possible extensions of the model for DNA are discussed. From our results we can conclude, that solitons exist in stacked systems without an additional backbone. At least the degree of freedom which couples a nucleotide base (pair) to the sugar-phosphate backbones (N-C stretching vibration) has to be treated with the help of the quantum equations of motion.