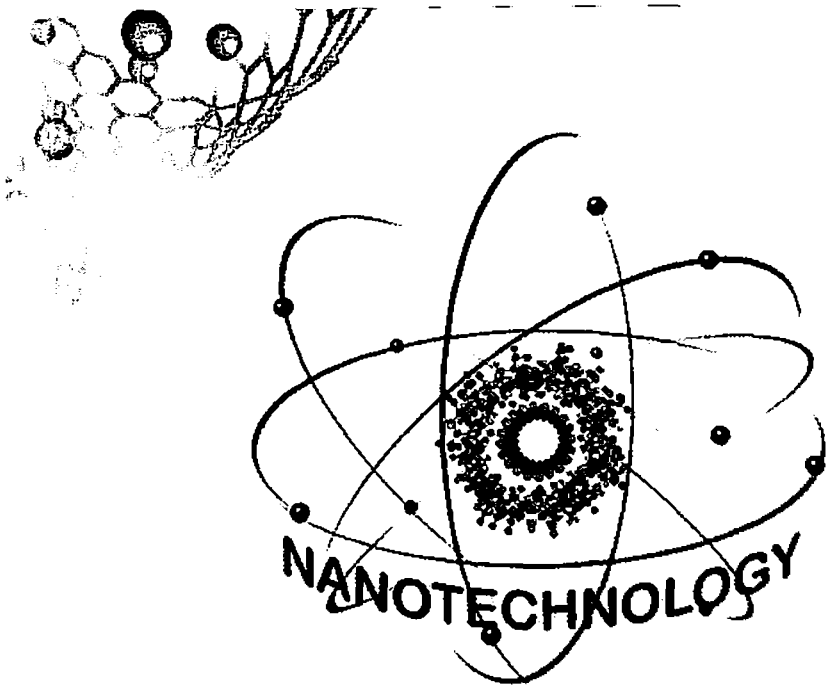

ABSTRACT BOOK

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Energy spectra of the fibonacci superlattice based on the gapped Graphene

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We evaluate the energy spectra of the quasi–periodic superlattice (SL) based on the monolayer gapped graphene. The SL consists of the rectangular one-dimensional potential barriers. We propose to create the quasi-periodic Fibonacci modulation due to the difference in barriers heights while gaps of initial energy value Δ are supposed to be equal along the SL chain. Evaluations are carried out by the transfer martrix method on the basis of the Dirac-like equation which comprises the mass term. It is shown that the splitting of the allowed bands observed in every Fibonacci generation is very effective and it takes place in both cases of normal and oblique incidence of quasi-particles on the SL. There are two wide (for values of the parameters given) gaps in spectra which are attributed to the new Dirac point [1] and the Bragg gap respectively. They originated from the periodicity (i.e. they exist in the strictly periodical SL). A lot of narrower gaps arise due to quasi-periodical effect. The number of the allowed (forbidden) bands in a fixed energy interval, e.g. in a minimal period for every next generation is subjected to the Fibonacci inflation rule. Note that the width of the Dirac and Bragg gaps (as well as the width of other bands) are very sensitive to the values of the SL parameters chosen: the value of the gap, the barrier height and width, the quantum well width. The dependence of the spectra on the electrons energy and also on the barrier height and width reveals the periodical character.

1. Wang L.-G., Zhu S.-Y. Electronic bandgaps and transport properties in graphene superlatattice with periodic potentials// Phys Rev B., 2010. – **81**. – P. 205444–205450.

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