QUANTUM FIELD MODEL OF THE FERROMAGNETISM IN GRAPHEN STRUCTURES

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This work is devoted to the construction of the quantum field model, allowing, in particular, to describe ferromagnetic properties in graphen structures adequately to the results of physical and numerical experiments and its possible applications.

This nonlinear field model describes properties of monatomic graphen layers (forming two-dimensional surfaces), which are connected with presence of nontrivial function of distribution of the spin density, formed as a result of spontaneous breakout of the spin symmetry of valent electrons in atoms of carbon.

Within the limits of the offered model exact static and stationary decisions for the field function of the spin density, explaining, in particular, experimentally observed ferromagnetic properties of the graphen films are specified.

Quantitative estimations of a thickness of the domain wall, dividing areas with counter directed vectors of magnetization were suggested, which allows to check up offered theoretical model experimentally. Possible spintronic applications are discussed.