

Some problems of modelling the wave biophysical processes

Trokhimchuck P. P

*Anatolii Svidzinskiy Department of Theoretical and Computer Physics,
Lesya Ukrainka Volyn' National University,
Lutsk, 43025, Ukraine*

Trokhimchuck.Petro@vnu.edu.ua, trope1650@gmail.com

The problem of modeling electromagnetic wave processes in modern biophysics is related both to the study of biophysical processes themselves and to their application [1 – 7]. So, medical thermography is a modern diagnostic remote non-invasive informative method that has no radiation exposure and contraindications, based on the registration of the natural thermal radiation of the human body in the invisible infrared region of the electromagnetic spectrum [1, 2].

Unlike other types of diagnostics and treatment of various diseases, electromagnetic methods usually do not lead to undesirable side effects. It is known that X-ray radiation leads to the destruction of biological material. Therefore, methods related to the terahertz range of radiation are currently being proposed. These methods, which are associated with laser radiation, can completely replace existing X-ray equipment [1, 2].

Terahertz equipment can be either passive – conventional thermography, or active - terahertz replacement of X-ray radiation. In the latter case, the object under study is irradiated in the terahertz range of the spectrum [1, 2].

In addition to stationary processes, much attention is paid to non-stationary processes. The fact is that each spectral range of radiation corresponds to different biophysical (biochemical) processes [1 – 7].

Of particular interest are the processes of the soliton type [5 – 7]. These processes correspond to pulsed excitations of various nature. Thus, the excitation of the cell membrane is accompanied by the migration of ions in an intense membrane field [5, 6].

Such excitations include psychons and intellectons.

Psychons are excitations in the infrared range of the spectrum [5, 6]. Their mass is in the band

$$10^{-7}m_e \leq m_{ps} \leq 10^{-4}m_e,$$

where m_e is electron mass.

As experimental confirmation of the existence of radiation in this range, one can point to the radiation that accompanies the processes of destructive cellular changes – cytokinesis, mitosis, and necrosis [5, 6].

The movement of a space charge of a bicylindrical structure, which occurs in the region of a nerve impulse, is accompanied by ultralong electromagnetic radiation. Such particles include intellektons, the mass of which is in the range

$$10 m_e \leq m_{ps} \leq 10^3 m_e.$$

According to [5] intellectons, they can be responsible for the processes of thought propagation, telekinesis, etc.

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