Interaction between Millimeter Waves and their Micro and Nanotargets: The Modification of Information Fields in Biological Objects

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Abstract

The physical-technical characteristics of nanotechnologies such as the GaAs Gunn diode that works at very high frequencies and low intensity in the millimeter wave range favors a virtuous interaction with the electromagnetic fields of parts and systems of living organisms, such as cells, DNA, aqueous solutions, whose radiations have similar properties. This interaction favors their physical-mathematical, as well as real, anatomical-functional restructuring, in accordance with the laws of deterministic chaos and the characteristics of fractal geometry, when they move away from their physiological equilibrium of the strange attractor type. Understanding and measuring biological information fields helps us understand these phenomena in depth.

Introduction

The strange attractor [chaotic and fractal] can be seen not only from a mathematical point of view, as the equilibrium of a non-linear dynamic system, but also as a real, anatomical-functional image, a subtle complex topological superstructure whose matrix is essentially information. Such a superstructure governs, permeates and it is an integral part of each part of a living organism, both at the level of the microworld of particle physics and of the macroworld, for example, cells and their internal and external components (cell membrane, endoplasmic reticulum, mitochondria, glycocalyx, etc.), nuclear and mitochondrial DNA and their respective genomes, aqueous solutions, and macro-parts such as systems (e.g. lymphatic, micro-

circulatory, nervous, neuronal systems), organs, tissues (e.g. parenchyma, connective tissue) and viscera.

We know this from various biophysical studies, for example in cardiophysiology [1]. Important information is hidden in space-time oscillations, and by revealing it we discover that the degree of complexity of such waves is parallel to the system’s ability to adapt to perturbations, so that deterministic chaos is welcome in physiology, it promotes efficacy, efficiency, optimality, minimum energy expenditure in the behavior of biosystems, e.g. in microcirculation [2], while complexity is decreasing in pre-pathological and pathological states. This degenerative process of complexity can be observed mathematically and geometrically in the disintegration of the strange attractor.
have been formulated regarding the biophysical mechanisms with small biological objects [10]. Besides, different models for understanding the etc. is still missing. Currently the researchers try to suggest dif

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ing the noise, how it is possible to create a virtuous interaction between these millimeter radiations and its targets: cells, organs, tissues, water clusters, genome.

The fruitful interaction between an exogenous component such as millimeter waves, with well-defined properties just mentioned, and the various endogenous targets mentioned above, seems possible, also because each of these components has its own particular energetic anatomical-functional structure, and its particular information field, which however is not usually rigid, but is modifiable under certain conditions, such as when there is an interaction of similar, familiar radiations between the parts, thus favoring resonance phenomena. Each structure is also radiant, with a specific set of its own ra

of electromagnetic radiation in a microwave range, which is re

alised in a Gunn diode owing to the motility of electrons when they fluctuate between two equilibrium states, i.e. between two wells due to conditions known as negative resistance differential.

By exploiting these properties, these semiconductors have the ability to interact with the parts of a living organism, which are also radiant of weak electromagnetic fields, acting on their own internal structure [which is restructured into its radiant active dipole states]. In parallel the radiation affects the structures and functions of the biological objects with which the semiconductors come into contact, which are also radiant. This is possible in a particular range of the electromagnetic field, i.e. in the range of very high frequencies and low intensity waves [millimeter waves] between 30 and 70 GHz with the peak at 60 GHz [8] a range in which the cell membrane, the genome, the cells, the water clusters, the organs of our body, also vibrate. In this way it is possible to justify what is vaguely stated as a rebalancing of the functions of our organism, brought about by bioenergetic actions, for example with millimeter wave therapy, giving a well-argued physical-mathematical-topological substrate and interpretation, for example, restructuring the innate physiological strange attractor that distinguishes the matrix, the soul of every single part and whole of every living being.

The interaction between the Gunn diode and various targets such as cells (in particular the cell membrane and its potential, viruses and bacteria, water clusters, the mitochondrial genome) has given clinical results and significant clinical and biological effects [9]. But a satisfactory and exhaustive theoretical background that interprets and explains these successes from the point of view of theoretical physics, biophysics, biochemistry, etc. is still missing. Currently the researchers try to suggest different models for understanding the microwave interaction with small biological objects [10]. Besides, various hypotheses have been formulated regarding the biophysical mechanisms of the interaction between low intensity millimeter waves and biological objects. In particular, emphasis is given to resonance phenomena in the interaction between cells, between biomolecules and low intensity electromagnetic fields [11, 12, 13]. The main idea is that biological objects can perceive weak electromagnetic fields as a consequence of the hypothesis that millimeter waves are native, Innate, In biological objects, which use them to govern their vital functions. Water molecules possess among other things a large dipole moment of about 1.9 D, while their rotation frequencies cover a wide range, including the Extremely High Frequencies [EHF] millimeter band. There are therefore ideal conditions for the absorption of millimeter waves radiation by water molecules.

It was also discovered that a hydrogen atom located between the two closest oxygen atoms can take one of two positions: next to one of the oxygen atoms. One of the positions is stable, while the other is not. The energy of the transition of the hydrogen atom from the stable to the unstable state corresponds to that of an EHF quantum (typically the electromagnetic spectrum from 30 to 300 GHz). As a result, under the influence of EHF radiation, hydrogen atoms can transform into unstable states. They can subsequently return to their stable states with the inevitable-emission of EHF quanta, so called “water memory” [14]. Here is revealed the importance of using the Gunn diode and the Gunn effect! Therefore, water acts as a low-intensity molecular oscillator of electromagnetic waves in the EHF band. Water molecules can remain in the unstable state for a long time, on the order of several weeks.

Another important phenomenon discovered in recent decades is that of stochastic resonance, useful for explaining the interaction between millimeter waves and biological objects, including water clusters. Noise has been shown to play a “favorable” role in nonlinear systems by improving the strength of motion order in the systems. Furthermore, it has been shown to improve system performance, for example “to form more regular structures, increase the degree of coherence, to increase the gain factor and increase the signal-to-noise ratio.” It would also be useful to explore the role of chaotic resonance, although it is less easily reproducible and controllable than stochastic resonance. Stochastic resonance is a fundamental physical phenomenon that was previously unknown; it is observable in nonlinear dynamic systems and it allows controlling their main parameters.

In this way we close the circle, because it could be explained, through stochastic resonance, for example by exploiting the background resonance radiations, and by adequately controlling the noise, how it is possible to create a virtuous interaction between these millimetric radiations and its targets: cells, organs, tissues, water clusters, genome.

The fruitful interaction between an exogenous component such as millimeter waves, with well-defined properties just mentioned, and the various endogenous targets mentioned above, seems possible, also because each of these components has its own particular energetic anatomical-functional structure, and its particular information field, which however is not usually rigid, but is modifiable under certain conditions, such as when there is an interaction of similar, familiar radiations between the parts, thus favoring resonance phenomena. Each structure is also radiant, with a specific set of its own radiations, therefore when the interaction is virtuous and fruitful, it generates a modification of the structure, of the function [for example, epigenetic modifications if we feedback on the mito-
However, the problem remains of measuring the variations in the topological complexity of the forms, of these structures, which are necessarily modified by these interactions of weak electromagnetic fields, modifying the respective information fields associated with them. It is not easy to measure these fields full of information, particularly in a range between 30 and 70 GHz, but it is useful to remember the scientific contribution of one of the authors regarding the information fields of biological systems, and its discovery regarding the constitution of physical space [15]. Physical space is constituted as a fractal mathematical lattice of primary topological balls, named the tessellattice, from which particles emerge as fractally deformed cells [6]. When a particle moves in such a lattice, it gradually emits these fractals, which are spatial excitations and fragments of the particle mass. Then after passing a segment equal to the particle’s de Broglie wavelength the tessellattice return these excitations back to the particle restoring its initial mass. These spatial mass excitations were named ‘inertons’ [6]. Altogether, the particle and its inerton cloud are projected to the conventional quantum mechanical formalism as the particle’s wave-function.

Any material objects including biological cells and their components possess mass and they move or oscillate, which means that they also emit and then absorb their own inertons. But at special conditions these inertons [for instance, at an acceleration of the object studied] can be emitted from the object, and also external inertons can be absorbed by the object. So, at the absorption of external inertons the object is able to change its properties because inertons introduce a mass defect m into the object, which automatically alters its physical properties. That means that we can manipulate the behavior of the object using a source of inertons. In particular, we can change the object’s resonance frequency that characterized it before absorbing inertons. Exactly such a behavior of small biological objects was discussed in [15]. And thus an inerton field comes first in controlling the behavior of living objects.

Electromagnetic, acoustic and inerton waves being combined will allow one to significantly adjust the behavior of biological objects, in particular their individual micro and nano parts. Specifically, we can anticipate that a combination of electromagnetic microwaves generated by the GaAs Gunn diode with a source of inertons [even a lower frequency] will significantly influence the small biological object studied. Such new approach is promising.

References