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

Simone Caramel[1]; Volodymyr Krasnoholovets[2]*

[1]International Society of Quantum Biophysical Semeiotics, Treviso, Italy.

[2]Institute of Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine.

Corresponding Author(s): Volodymyr Krasnoholovets

Institute of Physics, National Academy of Sciences of Ukraine, Kyiv, Ukraine.

Email: krasnoh@iop.kiev.ua & atomhydrogen@gmail.com

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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, microcirculatory, 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

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[moving toward simpler and more banal equilibria] both from a topological and functional point of view, and similarly also in real observations, for instance of water clusters in the function of the nuclear and mitochondrial genome, and in the interactions between aqueous solutions [3-6], fields see Montagnier et al, [7]. This degenerative process can be observed both from mathematical-geometric-topological and functional anatomical point of view, and it should be correlated with the structure and function of information fields.

These examinations are endogenous factual data of the observed systems, which include in particular the biological systems of living organisms. However, we must ask ourselves whether we can interact with these parts and systems, from a biophysical and biomedical perspective, from an exogenous point of view, in such a way as to generate virtuous processes that maintain physiological conditions or restore them, restructuring both from the biophysical-mathematical and biological view, in reality, those structures that present dysfunctions [according to deterministic chaos theory) and disconnections (with respect to physiological connections or correlations, both in local and non-local reality) of some kind.

In this regard, the possibility offered by certain nanotechnologies, for example the Gunn diode, is relevant and important. Such a well-defined semiconductor as gallium arsenide, which owns a particular malleable crystalline structure, has the ability to restructure itself from an electronic point of view exploiting certain physical outcomes. First of all this is the phenomenon of electromagnetic radiation in a microwave range, which is realised 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 mitochondrial genome] and of its radiant field.

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 wavefunction.

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

1. Goldberger AL, Rigney DR, West BJ. Chaos and fractals in human physiology. Sci. AM, 1990; 262(2): 42-49.
2. Griffith TM. Temporal Chaos in Microcirculation. Cardiovascular Research. 1996; 31(3): 342-358.
3. Pollack GH. The Fourth Phase of Water. Beyond Solid, Liquid, and Vapor, Ebner & Sons 2013.
4. Dayenas E, Beauvais F, Amara J, Oberbaum M, Robinzon B, Miadonna A, et al. Human basophil degranulation triggered by very dilute antiserum against IgE. Nature. 1988; 333(6176): 816-818.
5. Del Giudice E. et al, Coherent structures in liquid water close to hydrophilic surfaces. J. Phys Conf. Ser. 2013; 442: 012028.
6. Krasnoholovets V. Structure of Space and the Submicroscopic Deterministic Concept of Physics. Apple Academic Press, Toronto. New York. New Delhi. 2017.
7. Montagnier L, Del Giudice E, Aïssa J, Lavallee C, Motschwiller S, Capolupo A, et al. Transduction of DNA information through water and electromagnetic waves. Electromagnetic Biology and Medicine. 2015; 34(2): 106-112.
8. Zhadobov M, Chahat N, Sauleau R, Le Quement C, Le Drean Y, Millimeter-wave interactions with the human body: state of knowledge and recent advances, In: International Journal of Microwave and Wireless Technologies, Volume 3 , Special Issue 2: 60 GHz Wireless Communication Circuits and Systems 2011; 237-247.
9. Caramel S, Stagnaro S, Pyatakovich FA, Yakunchenko TI, Makkonen KF, Moryleva ON. Background Millimeter Radiation Influence in Cardiology on patients with metabolic and premetabolic syndrome. Journal of Infrared and Millimeter Waves, Shangai, China. 2014; 1.
10. Jofre M, Jofre L, Jofre-Roca L. On the wireless microwave sensing of bacterial membrane potential in microfluidic-actuated platforms, Sensors. 2021; 21(10): 3420.
11. Haagensen JAJ, Bache M, Giuliani L, Blom N. S, Effects of resonant electromagnetic fields on biofilm formation in Pseudomonas aeruginosa. Appl. Sci. 2021; 11(16): 7760.
12. Calabrò E, Magazù S. Resonant interaction between electromagnetic fields and proteins: A possible starting point for the treatment of cancer, Electromagn. Biol. Med. 2018; 37(3): 155-168.
13. Betskii OV, Devyatkov ND, Kislov VV. Low-intensity Millimeter Waves in Biology and Medicine. Crit. Rev. Biomed. Eng. 2000; 28(1-2): 247-268.
14. Petrosyan VI. Resonance RF emission from water. Techn. Phys. Lett. 2005; 31: 1007-1008.