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A Review on Superluminal Physics and Superluminal Communication in light of the Neutrosophic Logic perspective

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Abstract

In a recent paper, we describe a model of quantum communication based on combining consciousness experiment and entanglement, which can serve as impetus to stop 5G-network-caused diseases. Therefore, in this paper we consider superluminal physics and superluminal communication as a bridge or intermediate way between subluminal physics and action-at-a-distance (AAAD) physics, especially from neutrosophic logic perspective. Although several ways have been proposed to bring such a superluminal communication into reality, such as Telluric wave or Telepathy analog of Horejev and Baburin, here we also review two possibilities: quaternion communication and also quantum communication based on quantum noise. Further research is recommended in the direction outlined herein. *Aim of this paper:* We discuss possibilities to go beyond 4G and 5G network, and avoid the unnecessary numerous health/diseases problems caused by massive 5G network. *Contribution*: We consider quaternionic communication and quantum communication based on quantum noise, which are largely unnoticed in literature. *Limitation:* We don't provide scheme for operationalization, except what we have provided in other paper.

Quote: "The Hertz wave theory of wireless transmission may be kept up for a while, but I do not hesitate to say that in a short time it will be recognized as one of the most remarkable and inexplicable aberrations of the scientific mind which has ever been recorded in history." —Nikola Tesla, *The True Wireless,* 1919.

1. Introduction

In line with the rapid development of new branch of foundational mathematics, i.e. Neutrosophic Logic, here we discuss potential application of NL theory in the field of telecommunication. See for recent papers on NL: [31-35]. It is known that nowadays telecommunication systems are predominated by RF systems, including numerous wireless systems, such as 4G Wi-Fi, 4G network etc. And the world is now in transition stage towards 5G network deployment.

A growing number of individuals are coming together in many countries - to attempt to block or stop the current telecoms roll-out of 5G electromagnetic microwave radiation which has proved to be extremely harmful to all sentient life forms, including plant life.[1]

It would prove invaluable if some methods could be found to render the 5G millimetre wave transmissions ineffective. In other words, to block or dissolve their ability to irradiate surrounding matter/life. Our concern is not to find a way to 'to protect the individual' but to prevent whole areas from being affected by microwaves via the tens of thousands of transmission bases that 5G requires - and from satellite sources.

In literature, there are known proposals or experiments which were purported to suggest possible ways to develop superluminal communication, to name a few: Telluric wave and also Telepathy analog way. For instance, in biofield site, it is written, which can be paraphrased as follows:

> "Torsion fields is one of the names given to the more unpretentious parts of the biofield. Torsion fields have additionally been alluded to as orgone, od, tachyon, aether, Tesla waves, scalar waves, the zero point field and then some. There is no settled upon logical agreement on these increasingly inconspicuous parts of the biofield. Torsion fields are guessed to the moderating mode for separation recuperating, which happens immediately and which research has been demonstrated that to be difficult to be transmitted through exemplary electromagnetic frequencies."[2]

See also Horejev and Baburin's paper [27]. Besides, there are also other suggestions of telepathic analog communications [28-30].

From Neutrosophic Logic perspective, we need to distinguish the subluminal communication from superluminal communication. In fact, Smarandache's Hypothesis states that there is no speed limit of anything, including light and "particles [16]. One of us (FS) also wrote in this regards:

> "In a similar way as passing from Euclidean Geometry to Non-Euclidean Geometry, we can pass from Subluminal Physics to Superluminal Physics, and further to Instantaneous Physics (instantaneous traveling). In the lights of two consecutive successful CERN experiments with superluminal particles in the Fall of 2011, we believe these two new fields of research should begin developing. A physical law has a form in Newtonian physics, another form in the Relativity Theory, and different form at Superluminal theory, or at Instantaneous (infinite) speeds – according to the S-Denying Theory spectrum. First, we extend physical laws and formulas

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[1] A brief explanation here: https://www.5gspaceappeal.org/the-appeal
[2] https://www.biofieldlab.com/whatisthebiofield

to superluminal traveling and to instantaneous traveling. Afterwards, we should extend existing classical physical theories from subluminal to superluminal and instantaneous traveling."[3]

While the idea behind Smarandache hypothesis is quite simple and based on known hypothesis of quantum mechanics, called Einstein-Podolski-Rosen paradox, in reality such a *superluminal physics* seems still hard to accept by majority of physicists.

The background idea and our motivation for suggesting to go beyond RF/subluminal communication towards superluminal communication are two previous papers: (a) there will be more than 720! (factorial) types of new diseases which may arise, if the 5G network is massively implemented – and the present covid-19 pandemic may be just the beginning; (b) in a recent paper [14], we describe a model of quantum communication based on combining consciousness experiment and entanglement, which can serve as impetus to stop 5G-network-caused diseases, and (c) another recent paper that we presented in CTPNP 2019, where we discuss a realistic interpretation of wave mechanics, based on a derivation of Maxwell equations from quaternionic Dirac equation [36]. From these previous papers, we come to conclusion to superluminal communication is not only possible, but it is indeed embedded in quaternionic Maxwell equations, which are close to their original idea by Prof. James Clerk Maxwell.

Therefore, in this paper we consider superluminal physics and superluminal communication as a bridge or intermediate way between subluminal physics and action-at-a-distance (AAAD) physics, especially from *Neutrosophic Logic* perspective. Although several ways have been proposed to bring such a superluminal communication into reality, such as Telluric wave or Telepathy analog of Horejev and Baburin, here we also review two possibilities: quaternion communication and also quantum communication based on quantum noise.

These two choices will be discussed in section 4. But first of all we will discuss what is the difference between subluminal communication and superluminal communication.

2. **What is the difference between subluminal communication and superluminal communication?**

According to Belrose, which can be paraphrased as follows:

> "The extremely plausibility of remote correspondences was established on the investigations of James Clerk Maxwell, and his conditions structure the premise of computational electromagnetics. Their accuracy was built up by Heinrich Hertz, when in 1887 he found EM radiation at UHF frequencies as anticipated by Maxwell. Since the spearheading work of Maxwell starting in the center 1850s, and of his adherents, a little gathering that got known as Maxwellians, which incorporated UK's Poynting and Heaviside, Maxwell's conditions have been read for longer than a century, and have demonstrated to be one of the best speculations in the historical backdrop of radioscience. For instance, when Einstein saw that Newtonian elements had as changed to be good with his exceptional hypothesis of relativity, he found that Maxwell's conditions were at

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[3] See Florentin Smarandache. url: http://fs.unm.edu/SuperluminalPhysics.htm

that point relativistically right. EM field impacts are created by the increasing speed of charges, thus Maxwell had naturally incorporated relativity with his conditions." [25]

History also told us that around a century ago, there was proponents of wireless telegraphy, including Marconi, and opponents of it, including Tesla. And there were records of conflict between Tesla and Marconi. History also told us that around the same months after wireless telegraphy networks were installed everywhere, there was a flu pandemic, just like we observed now. It is also known, that wireless telegraphy was based on RF technology, which is actually a subluminal physics, while Tesla preferred a superluminal technology beyond Radio Frequency (sometimes he referred to as *non-Hertzian* waves). See also [18-26].

For instance, Paul Brenner wrote:

> "Marconi's work is based on copies of patents of many other inventors without their permission. His so called original "*two-circuit*" device, a spark-gap transmitter plus a coherer-receiver, was similar to those used by Oliver Lodge in a series of worldwide reported tests in 1894. Tesla disputed that Marconi was able to signal for greater distances than anyone else when using the spark-gap and coherer combination. In 1900 Alexander Stepanovich Popov declared to the Congress of Russian Electrical Engineers: "[...] *the emission and reception of signals by Marconi by means of electric oscillations [was] nothing new. In America, the famous engineer Nikola Tesla carried the same experiments in 1893*." [20]

It is also known from history books, that in the last century, the understanding of the nature of electromagnetic phenomena was proceeding with a constant rivalry between two concepts of interaction: namely, Newton instantaneous *action at a distance* (IAAAD) and Faraday-Maxwell *short-range interaction*. Finally, the discovery of Faraday's law of induction (explicit time dependence of electromagnetic phenomena) and the experimental observation of electromagnetic waves seemed to confirm the short-range interaction. Nevertheless, the idea of IAAAD still has many supporters. Among the physicists who have developed some theories based, in any case, on this concept, we can find names such as Tetrode and Fokker, Frenkel and Dirac, Wheeler and Feynman, and Hoyle and Narlikar. This interest in the concept of IAAAD is explained by the fact that classical theory of electromagnetism is an unsatisfactory theory all by itself, and so there have been many attempts to modify either the Maxwell equations or the principal ideas of electromagnetism.

As Augusto Garrido wrote in his review to Chubykalo et al's book:

> "On the other hand, the famous article "*Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?*" by Einstein, Rosen and Podolsky published in Physical Review in 1935 revived this discussion in a new panorama. In this article Einstein made public his position against the Copenhagen interpretation of the quantum mechanics. The controversy unleashed since then made this article a very popular one for its implications in our physical and philosophical understanding of the physical reality. The main objective of this article was to demonstrate that the quantum mechanics, the same way the Newtonian mechanics was for the relativistic mechanics, is an incomplete theory, and therefore, transitory of reality. For that reason Einstein made evident what is now known as the EPR paradox. According to EPR quantum mechanics is no local theory, that is to say, it permits action at a distance and, that is forbidden by the relativity theory,   instantaneous   action   at   a   distance. Unfortunately for Einstein, and for common sense the experiment performed by Aspect seems to indicate that the IAAAD following from quantum mechanics exists. As a consequence of this confusion, physicists

are divided in two big groups according their position about IAAAD. These disputants are the quantum physicists and the relativists, who, almost after a century, have not been able to answer the old question whether the subject of their studies is a complete and integrated Universe – a physical Universe in its own right – or simply a assemblage of locally interacting parts."[15]

Therefore, to summarize the above paragraph, it seems we can distinguish among few technologies for communication:

- Subluminal RF physics → subluminal wave → subluminal communication
- Close to light speed physics → relativistic wave
- Superluminal physics → superluminal wave → superluminal communication
- Action at a distance physics → AAAD/quantum communication

From *Neutrosophic Logic* perspective, we can see that superluminal physics and superluminal communication are an intermediate way between the subluminal physics and AAAD physics, because in NL theory there is always a possibility to find a third way or intermediate state.

Summarizing:

Standpoint A (subluminal) → Intermediate (*superluminal*) → Standpoint B (AAAD)

In the next sections, we will discuss shortly quantum entanglement and how it can be used in developing new telecommunication technologies.

3. What is quantum entanglement?

In its simplest form the quantum theory's features can be reduced to: (a) wave function description of microscopic entities and (b) entanglement. Entanglement is a key property that makes quantum information theory different from its classical counterpart.[14]

According to Scolarici and Solombrino [5]:

> The essential difference in the concept of state in classical and quantum mechanics is clearly pointed out by the phenomenon of entanglement, which may occur whenever the product states of a compound quantum system are superposed. Entangled states play a key role in all controversial features of QM; moreover, the recent developments in quantum information theory have shown that entanglement can be considered a concrete physical resource that it is important to identify, quantify and classify.

Nonetheless, they concluded: "our research has pointed out a puzzling situation, in which the same state of a physical system is entangled in CQM, while it seems to be separable in QQM."

While entanglement is usually considered as purely quantum effect, it by no means excludes possibility to describe it in a classical way.

In this regards, from history of QM we learn that there were many efforts to describe QM features in more or less classical picture. For example: Einstein in 1927 presented his version of hidden variable theory of QM, starting from Schrödinger's picture, which seems to influence his later insistence that "*God does not play dice*" philosophy.[6][7]

Efforts have also been made to extend QM to QQM (quaternionic Quantum Mechanics), for instance by Stephen Adler from IAS.[8]

But in recent decades, another route began to appear, what may be called as Maxwell-Dirac isomorphism route, where it can be shown that there is close link between Maxwell equations of classical electromagnetism and Dirac equations of electron. Intuitively, this may suggest that there is one-to-one correspondence between electromagnetic wave and quantum wave function.

4. Two possible ways of superluminal communications

4.a. Maxwell-Dirac isomorphism through Quaternion algebra

Textbook quantum theory is based on complex numbers of the form $a_0 + a_1 i$, with i the imaginary unit $i^2 = -1$. It has long been known that an alternative quantum mechanics can be based on the quaternion or hyper-complex numbers of the form $a_0 + a_1 i + a_2 j + a_3 k$, with i,j,k three non-commuting imaginary units.[8]

On the other hand, recognizing that the Maxwell's equations were originally formulated in terms of quaternionic language, some authors investigate formal correspondence between Maxwell and Dirac equations. To name a few who worked on this problem: Kravchenko and Arbab. These authors have arrived to a similar conclusion, although with a different procedures based on Gersten decomposition of Dirac equation.[4]

This MD isomorphism can also be extended further to classical description of boson mass which was usually called Higgs boson[3], so it may be a simpler option compared to scale symmetry theory.

4.b. Quaternionic QM and Entanglement

Having convinced ourselves that Maxwell-Dirac isomorphism has sufficient reasoning to consider seriously in order to come up with realistic interpretation of quantum wave function, now let us discuss QQM and entanglement.

Singh & Prabakaran are motivated to examine the geometry of a two qubit quantum state using the formalism of the Hopf map. However, when addressing multiple qubit states, one needs to carefully consider the issue of quantum entanglement. The "quaternions" again come in handy in studying the two qubit state. [10]

In his exposition of Quaternionic Quantum Mechanics, J.P. Singh concluded that [9]:

> "Having established the compatibility of the Hopf fibration representation with the conventional theory for unentangled states, let us, now, address the issue of measurability of entanglement in this formalism. In the

context, "Wootters' Concurrence" and the related "Entanglement of Formation" constitute well accepted measures of entanglement, particularly so, for pure states. …

It follows that any real linear combination of the "magic basis" would result in a fully entangled state with unit concurrence. Conversely, any completely entangled state can be written as a linear combination in the "magic basis" with real components, up to an overall phase factor. In fact, these properties are not unique to a state description in the "magic basis" and hold in any other basis that is obtained from the "magic basis" by an orthogonal transformation…"

Singh & Prabakaran also suggest that this quaternionic QM may be useful for exploring quaternionic computing.[10]

Therefore, it shall be clear that entanglement and quantum communication have a sound theoretical basis.

4.c. Basic principles of quantum communication based on quantum noise

Our proposed communication method can provide an infinite number of infinite bandwidth communications channels for each user. See our recent paper describing one of plausible way to do quantum communication [14].

Communication using this method travels much faster than light. It does not use radio waves and does not need wires. It cannot be monitored nor tracked nor interfered with. It cannot be regulated due to the infinities involved, and due to the fact that it is unmonitorable. Each user benefits personally from the perfect information security provided by quantum communications.

Quantum communication does not harm any form of life, nor the environment, in any way, as quantum events are, and always have been, constantly a part of the Natural Environment. This method is not related to "Q-bits" nor "quantum teleportation" nor "quantum amplification" approaches, in any way. It is based on the Schrödinger equations of Quantum Mechanics. One of the features of the Schrödinger equations is a descriptive prediction of what is called "*quantum noise*". This is the constant "hiss" that one hears when using an FM radio, and setting the frequency selector in between active broadcast channels. The sound is called "quantum noise"

Quantum noise is observable at every location in the infinite volume universe. Quantum noise is the result of non-local Subquantum processes which cause apparently random quantum behaviors in physical systems, particularly those which involve electric, magnetic, or electromagnetic fields.

The situation is described by the quantum observable A of the system. This boils down to the fact that there is an expectation value in situations which involve quantum noise, which should normally appear as perfect randomity in the quantum system we are observing. Perfect randomity is called 3rd Order randomity and is completely unpredictable.

3rd Order randomy then represents the normal behavior of our quantum system as it interacts with Subquantum entities which are interacting with the system from up to infinity away and with up to an infinite velocity. 3rd Order randomy is the quantum expectation value of all Natural systems, in all locations and at all times.

There are ways to detect and predict quantum noise and the physical changes produced by quantum noise in quantum systems (These methods will not be discussed at this time). When we detect the quantum noise, for example, in the form of "white noise" between radio stations, we expect the quantum spectrum centered on the channel of our receiver to exhibit 3rd Order randomy in both electromagnetic frequency and magnitude domains, in our selected channel. However, environmental factors such as the presence of physical or non-physical forms of Consciousness can act on the 3rd Order randomy so as to bring predictability and order to the stream of random number which our E/M detector array passes on to our discriminator system.

Related to this, it was proved by instrumented experiments in the USA and in France during the 1990s that the Attention, Intentions, and Emotional State of operators of symplectic, complex, and standard electromagnetic transmission facilities, resulted in instantaneous changes in the radiation patterns of the transmission antennas.

All of the above mentioned facts can be useful for developing a working quantum communication device, see for further exposition of our method in [14].

5.   Concluding remarks

Despite its enormous practical success, many physicists and philosophers alike agree that the quantum theory is so full of contradictions and paradoxes which are difficult to solve consistently. Even after 90 years, the experts themselves still do not all agree what to make of it. In this paper, we review the most puzzling feature of QM, i.e. entanglement.

In the meantime, the problem of the dangers of 5G creates a potential to develop new solutions of telecommunications, without having to use 5G/RF technologies. Therefore, in this paper we consider superluminal physics and superluminal communication as a bridge or intermediate way between subluminal physics and action-at-a-distance (AAAD) physics, especially from Neutrosophic Logic perspective. Although several ways have been proposed to bring such a superluminal communication into reality, such as Telluric wave or Telepathy analog of Horejev and Baburin, here we also review two possibilities: quaternion communication and also quantum communication based on quantum noise.

From *Neutrosophic Logic* perspective, we discuss on superluminal physics and superluminal communication as an intermediate way between the subluminal physics and AAAD physics, because in NL theory there is always a possibility to find a third way or intermediate state.

Summarizing:

Standpoint A (*subluminal*) → Intermediate (*superluminal*) → Standpoint B (*AAAD*)

This paper was inspired by an old question: Is there an alternate way to communication beyond RF method?

Further research is recommended for future implementation.

Acknowledgment

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