Propagation of harmonic waves in Nature

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Author shows there are two different time in Nature. One of these times we know very well: this is time on our wristwatches. Time on "wristwatch" harmonic wave is different. When you change the frequency of the oscillation wave automatically changes time of its own "wristwatch", ie speed is constant at any frequency, but on the testimony of its own "wristwatch". It is hard enough to understand as this wave in terms of mathematics is not a function. Author gives design of waves, and in addition to this paper, he gives a mathematical proof of this design. The fallacy of the concept of special relativity follows from the proof and the examples that occur in Nature.

The propagation of harmonic waves of any frequency at a constant velocity Nature decided rather peculiar. What is this uniqueness, we consider on example of wave $y = \cos\omega\tau$. Note that the replacement frequency ω in the considered wave, at the same time leads to a change in the axis of the flexible (elastic) time τ:

$$y = \cos\omega\tau = \cos\left[\left(\frac{\omega}{\beta}\right)(\beta\tau)\right] = \cos\omega^*\tau^*, \tag{1}$$

where $\omega^* = \dfrac{\omega}{\beta}$, $\tau^* = \tau\beta$, $\beta > 0$ is arbitrary constant factor.

The basic condition for the function is the independence of its abscissa. In (1), this condition is not satisfied: each abscissa τ* has its frequency ω*. It follows that (1) is not a function which has a very unusual property. Note that in the coordinate system with the abscissa τ and ordinate y we can draw only one graph $y = \cos\omega\tau$. If we want to change frequency ω in this graph to another frequency $\omega^* \neq \omega$, then we must change the old abscissa τ to the new abscissa τ*. Natural question arises: "How to change the old abscissa τ to the new abscissa τ*?" The answer is very simple. When we draw a graph of y = cosωτ, then choose for τ some scale. Axis τ* has another scale: the selected scale for τ is multiplied by β. This means that we have the coordinate system (τ, y) with the graph $y = \cos\omega\tau$ and another coordinate system (τ*, y) with the graph $y = \cos\omega^*\tau^*$. It becomes obvious that the two waves have the same wave propagation velocity, so these waves differ from each other only scales. This in turn means that the coefficient β does not affect the velocity.

Suppose we have an opportunity to increase the frequency in (1) with β. Since, according to Planck energy of the wave is directly proportional to frequency, increasing the frequency we increase the energy of the wave. Behavior of the particle-wave in this case, consider the example of physics.

- 1. We consider the well-known example of physics called tunneling. In Wikipedia it is written: "Quantum tunneling or tunneling refers to the quantum mechanical phenomenon where a particle tunnels through a barrier that it classically could not surmount." More details about this phenomenon is written in [1, p. 55]: "….if you were to capture a single electron in a big, solid box and then slowly crush the sides …, you would find the electron getting more and more frantic. Almost as if it were overcome with claustrophobia, the electron will go increasingly haywire – bouncing off of the walls of the box with increasingly frenetic and unpredictable speed… The motion of microscopic particles becomes increasingly wild when they are examined and confined to ever smaller regions of space." As a result, this electron is doing what in terms of classical physics is impossible: it immediately passes through the box to penetrate that it had lacked energy. The reason of this phenomenon is a structure of wave (1): shifting the walls of the box, we reduce the wavelength increasing the energy of the electron. So, it is impossible under the previous energy, it becomes possible by the increased energy. This immediately implies the claim is wrong in wikipedia that tunneling refers to the quantum mechanical phenomenon.

The above example shows that there are two time axes: t is time on our wristwatches and τ is time on "wristwatch" harmonic wave $\cos\omega\tau$. Let us assume the reader has agreed with the author that there are two axes. In addition, let the passage of time on the axis t coincides with the passage of time on the axis τ (truth is known in comparison). Then the passage of time on the axis $\tau^* = \beta\tau$ ($\beta \neq 1$) cannot coincide with time axis t. If the passage of time t and τ^* is not the same, then there are only two options: the passage of time τ^* is accelerated compared with the passage of time t and the passage of time τ^* is slowing compared to t.

In what follows we consider the option, when the passage of time τ^* is accelerated compared to t because this case has never been considered in the literature. About the option when the passage of time τ^* is slowing compared to t, the reader can learn from the book [1, pp. 23-24]: "When sitting at rest in the laboratory, muons disintegrate by a process closely akin to radioactive decay, in an average of about two millionths of a second. This disintegration is an experimental fact supported by an enormous amount of evidence. It's as if a muon lives its life with a gun to its head; when it reaches two millionths of a second in age, it pulls the trigger and explodes apart into electrons and neutrinos. But if these muons are not sitting at rest in the laboratory and instead are traveling through a piece of equipment known as a particle accelerator that boosts them to just shy of light-speed, their average life expectancy as measured by scientists in the laboratory increases dramatically. This really happens. At 667 million miles per hour (about 99.5 percent of light speed), the muon lifetime is seen to increase by a factor of about ten." At the end of this paper, we will return to this fact (see below for item 4) and explain why this is happening. Now just note that this is possible, if the passage of time τ^* for "wristwatch" muons slowed compared with t.

Thus, rapid traverse τ^*, obviously possible when $\beta > 1$, "wristwatch" of wave $\cos\omega^*\tau^*$ ticking β times faster. This means in turn that this wave travels a distance that is in β times more the distance that the wave $\cos\omega\tau$ passes. Since, according to Planck energy of the wave is directly proportional to frequency, so the first option we can formulate different: "Low-energy wave passes given distance in a shorter time and vice versa, high-energy wave passes given distance for a longer time."

Concider two examples from Internet site http://www.newscientist.com/article/mg20327246.800-13-more-things-magic-results.html#.UwZuJEJ5Mf, which demonstrate a complete coincidence with the construction of the wave (1).

- 2. In 2005, researchers at the MAGIC gamma-ray telescope on La Palma in the Canary Islands were studying gamma-ray bursts emitted by the black hole in the centre of the Markarian 501 galaxy, half a billion light years away. The burst's high-energy gamma rays arrived at the telescope 4 minutes later than the lower-energy rays. Both parts of the spectrum should have been emitted at the same time.
- 3. The mystery has only deepened with the launch last year of NASA's Fermi gamma-ray space telescope. It has observed high-energy photons arriving up to 20 minutes behind zippier low-energy ones from a source 12 billion years away.

When the frequency increases, the passage of time τ^* is slowing, as it follows from (1). Slowing τ^* means that the duration of the life of the particle-wave increases. Consider example 1 again from a different perspective.

- 4. In the case of muons, which were considered above, the duration of life has increased by 10 times, therefore, the frequency of oscillation according to (1) increased 10 fold. However, the increase in frequency of 10 times leads to an increase of the muons energy at the same 10 times. Researcher itself increased kinetic energy muons in the accelerator when increased speed to nearly the speed of light. Everything is logical and easy to verify, by measuring the oscillation frequency of the muons before and after the accelerator. However, modern physics has another explanation of this fact. You can read about it in [1, p. 24]: "The explanation, according to special relativity, is that "wristwatches" worn by the muons tick much more slowly than the clocks in the laboratory, so long after the laboratory clocks say that the muons should have pulled their triggers and exploded, the watches on the fast-moving muons have yet to reach doom time. This is a very direct and dramatic demonstration of the effect of motion on the passage of time." In connection with the text of [1] the author wants the reader to pay attention that the special theory of relativity does not explain the facts set forth in examples 1, 2, 3.
- 5. Draw the reader's attention to the phenomenon known in the literature as the paradox of "twins". This paradox is associated with the approval of [1, p. 24]: "If people were to zip around as quickly as these muons, their life expectancy would also increase by the same factor. Rather than living seventy years, people would live 700 years." Time t is time of living nature, it does not

accelerate and decelerate, and the reader knows the reason for this behavior of our watches.

Design (1) eliminate the paradox of "twins", as τ is the time inanimate Nature and it really not only can slow, but also to accelerate, as shown above.

Reference

1. B. Greene. The Elegant Universe: Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory. Vintage Books, N-Y, ISBN 5-354-00167-7, 1999.
2. F. Hovsepian. An Alternative View of the Universe Structure (on the invalidity of the four dimensional space-time concept).
3. A.Y.Khinchin. Korrelationstheorie des stationaren stochastischen Prozesse. Mathematische Annalen, v.109, 1934, pp. 604-615.

Addition

The author's paper [2] from http://www.arxiv.org/abs/0711.1300 has the output of the function

$$h_i(\tau) = \int_{-\infty}^{\infty} \cos\omega\tau V_i(\omega)d\omega \quad (i = 1, 2, 3) \qquad (!)$$

in Appendix 1. We remind the reader function $h_i(\tau)$ satisfies the Khinchin theorem [3], therefore $h_i(\tau)$ is the correlation function of a continuous stationary random process $\xi_i(t)$. In turn, this means that

$$\tau = t_2 - t_1$$

is the interval of time between the sections of this $\xi_i(t)$ at arbitrary times t_1 and t_2. In [2] τ is called flexible (elastic) time. In Appendix 2 there is a proof twice differentiable functions $h_i(\tau)$ of τ under the integral as the parameter. The author found recently, this function is differentiable formally, but actually not. The reason is that ω and τ depend on each other, ie argument τ is not independent. To prove this, we make in (!) the change of variable

$$\omega^* = \beta\omega, \quad (\beta > 0) ::$$

$$h_i(\tau) = \int_{-\infty}^{\infty} \cos\omega\tau V_i(\omega)d\omega = \frac{1}{\beta}\int_{-\infty}^{\infty} \cos\left[(\beta\omega)\left(\frac{\tau}{\beta}\right)\right] V_i\left(\frac{\beta\omega}{\beta}\right) d(\beta\omega) . \qquad (!!)$$

Put in (!!) $\tau = 0$:

$$h(0) = 1 = \int_{-\infty}^{\infty} V(\omega)d\omega = \int_{-\infty}^{\infty} \frac{1}{\beta} V\left(\frac{\omega^*}{\beta}\right) d\omega^* = \int_{-\infty}^{\infty} \overline{V}(\omega^*)d\omega^*,$$

ie by replacing got another (new) normalized spectral density

$$\overline{V}_i(\omega^*) = \frac{1}{\beta} V_i\left(\frac{\omega^*}{\beta}\right).$$

Note that in the integral (!!) we have τ, and after replacing appeared β, which cannot stick anywhere except to τ, since ω^* is integration variable:

$$\int_{-\infty}^{\infty} \cos\left(\frac{\omega^*}{\beta}\tau\right) \overline{V}_i(\omega^*)d\omega^* = \int_{-\infty}^{\infty} \cos\left[\omega^*\left(\frac{\tau}{\beta}\right)\right] \overline{V}_i(\omega^*)d\omega^* .$$

Therefore (!!) can be rewritten as

$$h_i(\tau) = \int_{-\infty}^{\infty} \cos\omega\tau V_i(\omega)d\omega = \int_{-\infty}^{\infty} \cos\left(\omega^* \tau^*\right)\overline{V}_i(\omega^*)d\omega^* = \overline{h}_i(\tau^*), \ \left(\tau^* = \frac{\tau}{\beta}\right).$$

Note replacement of frequency ω in (!!) at the same time led to a change in the axis of the flexible (elastic) time τ. This immediately implies that the concept of four-dimensional space-time is an erroneous concept. Space and time are not connected to each other, ω and τ are connected to each other. This means that the Nature is stationary and requires other methods for investigation.