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# The Lorentz Factor and the Probability Density

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*Abstract-* New Cartesian physics based on the identity of space and matter and makes the principle of uncertainty Heisenberg by a principle of physical irrationality of points of space-matter from which naturally follows a probabilistic way of describing the developments in quantum mechanics. New Cartesian physics relates the probability of an event in quantum mechanics with the factor of Lorentz of the special theory of relativity, which turns idle geometric space in the physical, in which space moves.

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# The Lorentz Factor and the Probability Density

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## 1. Introduction

The factor of Lorentz in physical formulas appeared after physicists began to consider the limitation of speed of movement of bodies the speed of light. Obviously, this limitation occurs as a result of changes in the parameters of the interaction of bodies that were found during their movement with the speed close to zero. It was necessary to find an operator whose effect on the existing formula limited of speed of movement of bodies the speed of light. This operator was found by Lorentz and named after him.

$$\gamma = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}$$

With increasing speed from 0 to *c* the Lorentz factor $\gamma$ increases from 1 to $\infty$.

When the impact of this operator statement when increasing speed to the speed of light occurs:

*Time dilation:* The time ($\Delta t'$) between two ticks as measured in the frame in which the clock is moving, is longer than the time$\Delta(t)$ between these ticks as measured in the rest frame of the clock $\Delta t' = \gamma \Delta t$; Length contrac- tion: The length ($\Delta x'$) of an object as measured in the frame in which it is moving, is shorter than its length ($\Delta x$) in its own rest frame $\Delta x' = \Delta x/\gamma$; And so more [1]

The impact of this statement when increasing speed to the speed of light converts idle space in a moving space. Figuratively speaking a world in which there is no movement in a world in which everything is moving.

The famous Cartesian identity "space ≡ matter" makes a point of the geometric space a material and therefore capable of movement. Unlike geometric space, it should be called physical, i.e. able to move.

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New Cartesian physics, based on identity of space and matter, argues that space is moving and movement is the main vortex, i.e. the circumference. In this case the linear motion is movement on a curved path with an infinitely large radius of curvature. The cause of vortex motion space new Cartesian physics sees that the impact of the factor of Lorentz for the motion trajectory reduces the length of segments and speed on her because of the law of conservation of momentum increases and reaches the rotation center of the speed of light. We can assume that the space-matter moving in such a way to neutralize the paradoxes of relativity theory.

At the heart of quantum mechanics lies Heisenberg's uncertainty principle, which implies a probabilistic method for determining the state of the electron. In new Cartesian physics ethe principle in the physical space turns into its opposite, i.e., becomes a principle of definiteness of points. To show this is to take the most known attitude of uncertainty Heisenberg — between coordinate and momentum of a particle in space:[2]

$$\Delta x_i \Delta p_i \geq \frac{\hbar}{2}$$

where "$\hbar$" is Planck's constant (h) divided by $2\pi$;
$\Delta p_i$ - Increment of the momentum.

Note that here the right and left are the expression of the angular momentum and therefore $\Delta x_i = \sqrt{R_0^2 - R^2}_i$ determines the standard deviation of the radius-vector of rotation $R$ from the radius-vector $R_0$

The principle of uncertainty Heisenberg between coordinate and momentum of a particle can be written as:

$$\Delta p_i \geq \frac{\hbar}{2\sqrt{R_0^2 - R^2}}$$

This inequality shows that reducing the interval containing points with coordinates $x_i^0 \leq x \leq x_i$ that correspond to the radius-vectors $R$ and $R_0$, it is necessary to increase the increment pulse for the selection of this point of space-matter from other points. In the infinitely small interval containing the point, this increment of the momentum becomes infinitely large, which is almost impossible to create. For this reason, to highlight this point as an independent object impossible. It stands out only in the interval. Thus, the uncertainty principle of Heisenberg in new Cartesian physics becomes a principle of physical irrationality of points of space-matter.[6]

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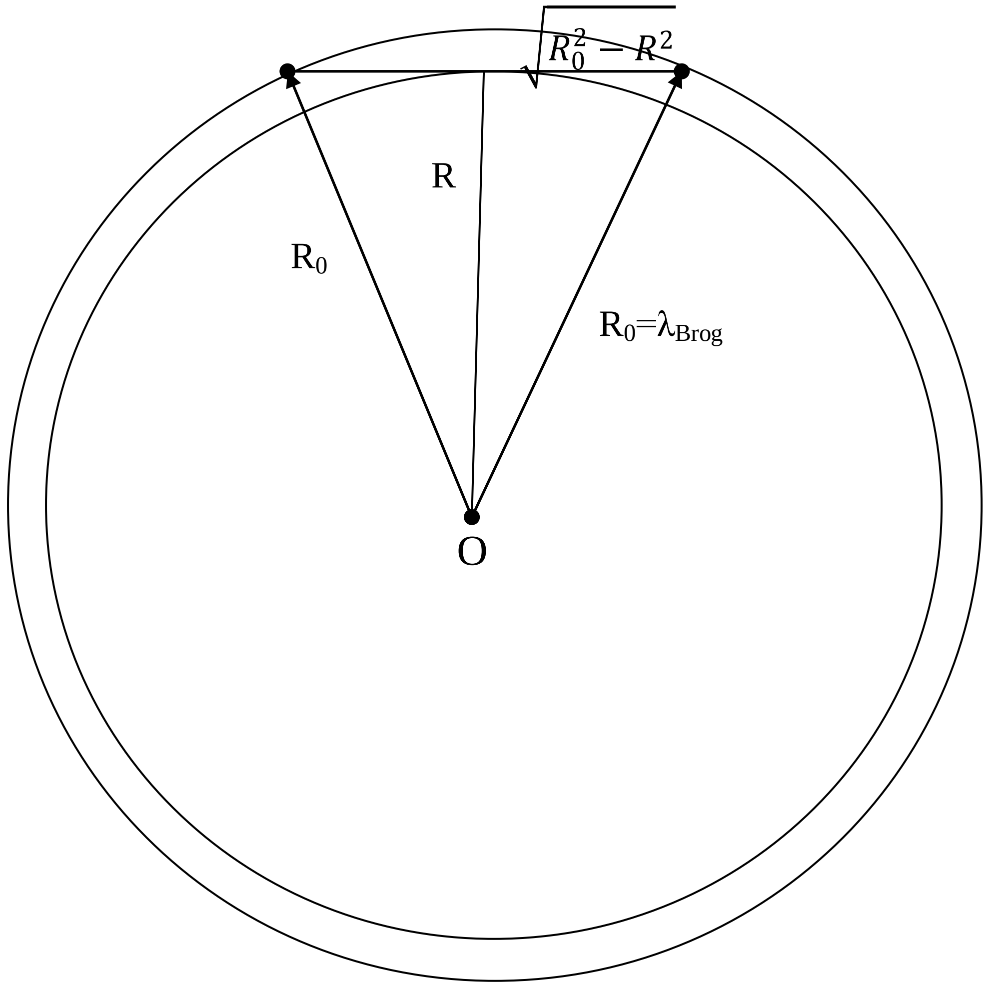


*Figure 1*

From this it follows that the space-matter moves relative to itself overlapping each other by intervals (fragments), the size of which is determined by the principle of certainty of the irrational points of the Heisenberg- Dizhechko

Representation of irrational points of space-matter in the form of intervals is the basis of a probabilistic description of events of moving space-matter, as intervals are involved simultaneously in many spins and variations, and the size determines their spacing depend on the magnitude of the impulse.

Application of the theory of probabilities of events in space-matter is based on a geometric definition of probability. The geometric probability of an event A is the ratio of the measure of area *g*, conducive to the emergence of an event A to the measure of whole area G, i.e. P(A)=*mes g* / *mes G*.

Consider the simultaneous motion of space-matter in an oscillatory motion and in rotation. In this case, event A is the part of the points of the wave space-matter at the quantum rotational motion. Therefore, the probability of an event A is equal to the ratio *mes g* participating in the rotation measure across the region *mes G*, which is the oscillation.

Write a system of equations consisting of the formulas of wave-particle duality and the formulas lower limit of the Heisenberg inequality when the speed limit is the speed of light

$$\begin{cases} mvR_0 = \dfrac{\hbar}{2} \\ \Delta(mc)\Delta R = \dfrac{\hbar}{2} \end{cases}$$

Dividing the second equality in the first, get

$$\frac{\sqrt{R_0^2 - R^2}}{R_0} = \frac{v}{c}$$

After conversion you will get:

$$R = R_0\sqrt{1 - \frac{v_0^2}{c^2}}$$

This formula is analogous to the formula for the Lorentz transformation; it shows a reduction of radius at aspiration of speed of rotation to the speed of light. Multiplication on 2*π* the formula is to mind: $\frac{S_1}{S_0} = 1 - \frac{v_0^2}{c^2}$, where the attitude $\frac{S_1}{S_0}$ shows probability of that the particle on the area $S_0$ will be in $S_1$.

Oscillation and rotation of space-matter can be displayed on a complex plane by the formulas:

$$\psi_1 = R_1 e^{\frac{i}{\hbar}Et} \text{ and } \psi_2 = R_2 e^{\frac{i}{\hbar}px}$$

Dividing $\psi 2$ for $\psi 1$, obtain the wave function for the wave of space-matter:

$$\psi = \frac{\psi_2}{\psi_1} = Ae^{-\frac{i}{\hbar}(Et-px)}$$

Where module $A=R_2/R_1$ is a dimensionless number. Multiplying $\psi$ in the adjoint function $\psi^*$, will receive a square module $[\psi]^2=R_2^2/R_1^2$, which in quantum mechanics has the meaning of probability density.

Thus, the wave function of quantum mechanics:

$$\Psi = Ae^{-(i/\hbar)(Et-px)}$$

you can write as a ratio:

$$\Psi = \frac{A_1 e^{i\frac{px}{\hbar}}}{A_2 e^{i\frac{Et}{\hbar}}}$$

Here A, $A_1$ and $A_2$ – modules of complex numbers, geometrical representation they are radius-vectors. In quantum mechanics the square modulus of the wave function is the probability density of the event of finding particles at time t+Δt in region with coordinates x+Δx.

$$|\Psi|^2 = |A|^2 = \frac{|A_1|^2}{|A_2|^2}$$

By multiplying the numerator and denominator of fraction to 2$\pi$ formulas should be converted to the form:

$$|\Psi|^2 = |A|^2 = \frac{2\pi|A_1|^2}{2\pi|A_2|^2} = \frac{S_1}{S_2}$$

Where, the attitude $\frac{S_1}{S_2}$ shows probability density that a particle on the area.

$S_2$ will be in the $S_1$. Thus detected identity of probability of event in quantum mechanics with the formula of Lorentz transformation.

$$|\Psi|^2 = (\sqrt{1-\frac{v_0^2}{c^2}})^2 = \frac{1}{\gamma^2}$$

According to this expression the probability density of detecting a particle of physical space inversely proportional to the Lorentz factor and is a function of speed. If it is at rest in some reference frame, the probability of detecting it is equal to 1 if it is moving relative to some frame of reference with a speed close to the speed of light, the probability of finding it decreases to zero, which is equivalent to reducing the density of physical space. When moving space-matter at the speed of light, it is on the verge of disappearance and formation on its place the so-called "black hole." The motion of the waves, the formation of black holes is prevented by the movement of space-matter, which manages to fill them with the speed of light. At creation of conditions preventing their filling, for example, when a three-dimensional whirling motion of a physical space formed independent physical objects, which are called material particles.

## References Références Referencias

1. https://en.wikipedia.org/wiki/Lorentz_factor
2. "*Atomik Physics*" by Max Born, London – Glasgow, 1963
3. Descartes, René. *The World and Other Writings*. Trans. Stephen Gaukroger. New York: Cambridge University Press, 1998.
4. https://en.wikipedia.org/wiki/Compton_wavelength
5. Bousso R (2000) Positive vacuum energy and the n-bound. J High Energy Phys 11: Zlatev, Wang L, Steinhardt PJ (1998) Quintessence, cosmic coincidence and the cosmological constant. Phys Rev Lett 82: 896.
6. http://gsjournal.net/Science-Journals-Papers/Author/180/Boris%20S.,%20Dizhechko