«Black holes»

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Abstract . We will talk about the properties of "black spheres" called "black holes", within the framework of the properties of dynamic space-matter, which are subject to experimental testing. First of all, the presence of new quanta in the cores of planets, in the cores of stars, in the cores of galaxies, in the cores of quasars and in the cores of quasar galaxies. And first of all, stable quanta of the new substance.

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1.Introduction.

It is generally accepted (in 2020) that there is a "supermassive compact object in the center of the Galaxy." And there is the fact of the presence of dynamic space-matter,

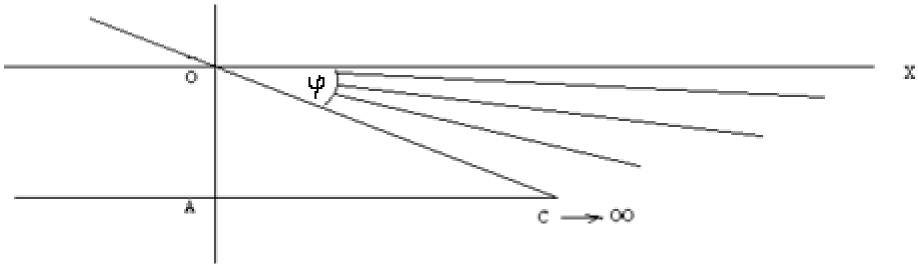
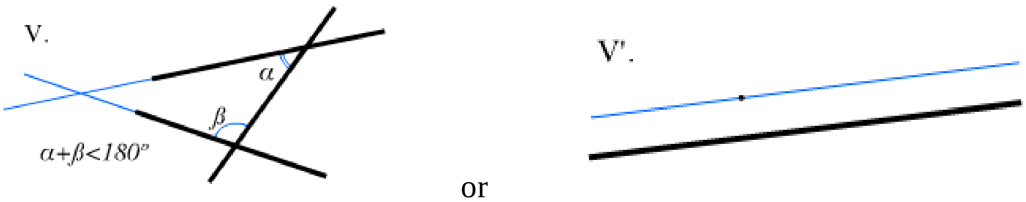


Fig. 1 dynamic space of a bunch of parallel straight lines

within the always dynamic $(\varphi \neq const)$ angle of parallelism. There is no matter outside space, and there is no space without matter, therefore space, as a form of matter, is one whole. Infinity (AC→ ∞) cannot be stopped, therefore such dynamic space-matter always exists. The limiting case $((\varphi = 0) = const)$of $((\varphi \neq 0) = const)$dynamic space-matter is the Euclidean axiomatics and Riemannian space in particular.

1. "A point is something of which nothing is a part") ("Principles" by Euclid) . and is a Point something that has no parts,
2. Line - length without width.
3. and 5th postulate about parallel straight lines that do not intersect. If a straight line intersecting two straight lines forms interior one-sided angles less than two right angles, then, extended indefinitely, these two straight lines will meet on the side where the angles are less than two right angles.



or

rice. 2 Euclidean axiomatics

Within the framework of the Euclidean $(\varphi = 0)$axes grid, we do not see dynamic $(X+= Y-),(X-= Y+)$ space-matter, and we will not be able to imagine it. Therefore, the axioms of dynamic space-matter are introduced as facts that do not require proof. Already in these axioms the problem of the Euclidean axiomatics of a point, as a set of indivisible sphere-points, is solved in one indivisible sphere-point, but already on (n) convergence, dynamic space-matter.

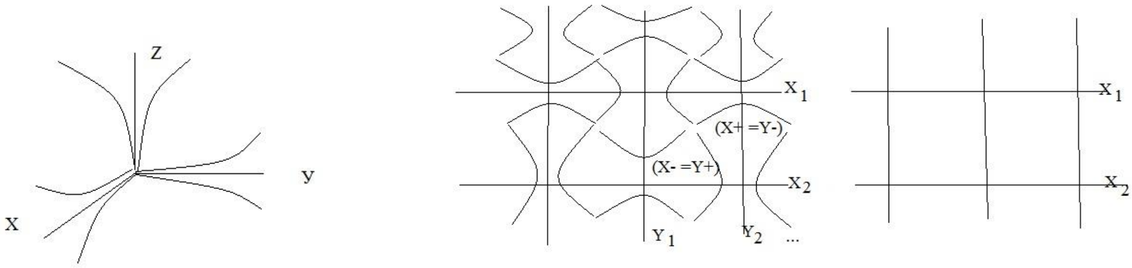


Fig.3 dynamic space-matter/

Any fixation (in experiments) of a non-zero $(\varphi \neq 0)$angle of parallelism gives a multi-leaf Riemannian space.

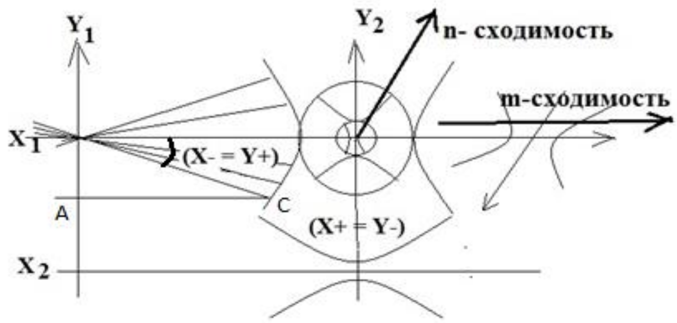


Fig. 3a. dynamic space-matter

Now within the framework of the axioms of dynamic space-matter in the form:

1. A non-zero, dynamic angle of parallelism $(\varphi \neq 0) \neq const$, a beam of parallel straight lines, determines the orthogonal fields $(X-) \perp (Y-)$of parallel lines - trajectories, as isotropic properties, of space-matter.

2. Zero angle of parallelism $(\varphi = 0)$, gives a “length without width” with a zero or non-zero Y_0 radius of a sphere-point “having no parts” in the Euclidean axiomatics.

3. A bundle of parallel lines with zero angle of parallelism $(\varphi = 0)$, “equally located to all its points , ” produces many straight lines in one “widthless” Euclidean straight line.

4. Internal $(X-),(Y-)$and external $(X+),(Y+)$fields of line-trajectories are non-zero $X_0 \neq 0$ or $Y_0 \neq 0$material sphere-point, form an Indivisible Area of Localization $НОЛ(X\pm)$or $НОЛ(Y\pm)$ dynamic space-matter.

5. In unified fields $(X- = Y+)$, $(Y- = X+)$orthogonal lines-trajectories, $(X-) \perp (Y-)$ there are no two identical sphere-points and lines-trajectories.

6. A sequence of Indivisible Areas of Localization $(X\pm)$, $(Y\pm)$, $(X\pm)$... along a radius $X_0 \neq 0$ or $Y_0 \neq 0$a sphere-point on one line-trajectory gives n convergence, and on different trajectories m convergence.

7. Each Indivisible Area of Localization of space-matter corresponds to a unit of all its Evolution Criteria - CE, in a single $(X- = Y+)$space $(Y- = X+)$-matter at $m-n$convergences,

$$НОЛ = КЭ(X- = Y+)КЭ(Y- = X+) = 1, \quad НОЛ = КЭ(m)КЭ(n) = 1,$$

in a system of numbers of units equal by analogy.

8. Fixation of an angle $(\varphi \neq 0) = const$ or $(\varphi = 0)$a bundle of straight parallel lines, space-matter, gives Euclid's 5th postulate and the axiom of parallelism.

Any point of fixed line-trajectories is represented by local basis vectors of Riemannian space:

$$\boldsymbol{e_i} = \frac{\partial X}{\partial x^i}\boldsymbol{i} + \frac{\partial Y}{\partial x^j}\boldsymbol{j} + \frac{\partial Z}{\partial x^k}\boldsymbol{k}, \quad \boldsymbol{e^i} = \frac{\partial x^i}{\partial X}\boldsymbol{i} + \frac{\partial x^j}{\partial Y}\boldsymbol{j} + \frac{\partial x^k}{\partial Z}\boldsymbol{k},$$

with fundamental tensor $e_i(x^n) * e_k(x^n) = g_{ik}(x^n)$ and topology $(x^n = X, Y, Z)$ in Euclidean space. That is, Riemannian space is a fixed $(\varphi \neq 0) = const)$ state of dynamic $(\varphi \neq const)$ space-matter. Local basis vectors correspond to the velocity space $W^N = K^{+N} T^{-N}$, in multidimensional space-time. Space-time is a special case of a fixed state of dynamic space-matter. At the same time, all Criteria for the Evolution of Matter are formed in multidimensional space-time. They are presented in the "Unified Theory 2", in the form of: ($P = W^2$) potential, ($F = P^2$) force, energy: charge PK=q (Y+ =X -) in electro (Y+ =X -) magnetic fields, or mass PK=m (X+=Y-) in gravit (X+=Y-), mass fields, then density $\rho = \frac{m}{V} = \frac{ПK}{K^3} = \frac{1}{T^2} = \nu^2$ is the square of frequency, energy $E = P^2 K$, impulse ($p = P^2 T$), action ($\hbar = P^2 KT$)…, a single space-matter.

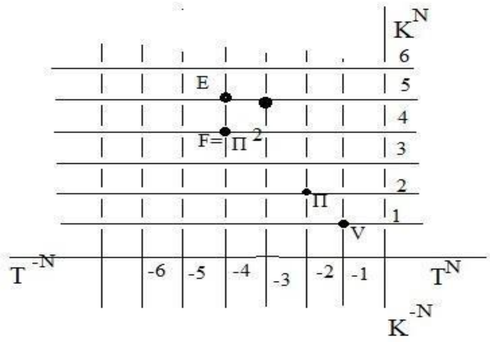


Fig.4 unified Criteria for the Evolution of space-matter.

Let us immediately note the "point that has no parts" in the Euclidean axiomatics, and the non-zero radius $X_0 \neq 0$or $Y_0 \neq 0$material sphere-point of the axioms of dynamic space-matter. In addition, there is a minimum Planck length ($\lambda = 10^{-33}$ $см$). These are questions of singularity that are not here, plus the mathematical prohibitions of division by zero.

As part of a dynamic $(\varphi \neq const)$ space-matter, we have a non-stationary Euclidean space - time (X , Y , Z , cT), or a geodesic variable $(\boldsymbol{x^s} \neq const)$, fundamental tensor$\boldsymbol{g_{ik}}(\boldsymbol{x^s})$ Riemannian space. For example , the no stationary space of Lobachevski geometry, with variable asymptotes of hyperbolas. There is no such mathematics yet.

In other words, we will consider the issues of "black holes" in the axioms of Euclidean space-time, as a special case $(\varphi = 0)$or $((\varphi \neq 0) = const)$dynamic $(\varphi \neq const)$space-matter.

2.Assumptions

Within the framework of classical physics, even 100-200 years ago, and in the laws of conservation of energy

$E_k = \frac{mv^2}{2}$ and $E_n = mgh$, for $g = \frac{GM}{R^2}$ and $h = R$ Earth,

the maximum speed was determined: $\frac{v^2}{2} = \frac{GM}{R}$, $v^2 = \frac{2GM}{R}$, in which the body may not return to Earth (M). And even then, the hypothesis of super massive $(M \neq 0)$ "black stars", from which light does not come out, arose. The sphere of such "black stars" $R_0 = \frac{2GM}{c^2}$ was called the Schwarzschild sphere. The reason was considered to be Newton's gravitational force, $F = \frac{2GMm}{R^2}$. Here

R is the distance between the centers of massive $(M \neq 0)$ and $(m \neq 0)$massive spheres, the Earth and the Moon, for example. But if a small ball is lowered into the diametrical hole of a large massive sphere $(R \to 0)$, then the force does not increase indefinitely.

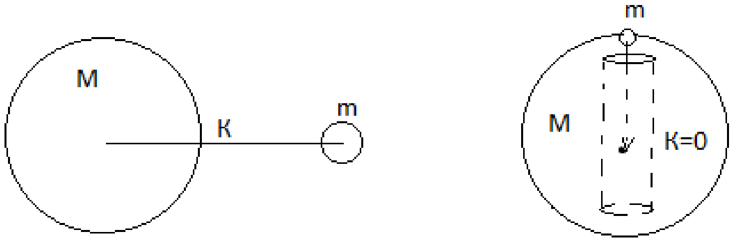


Fig.4a. Newton's law

Newton's law doesn't apply here. Newton introduced the very concept of force from the springy collision of two balls, with inverse proportionality to their accelerations of expansion.

$$\frac{m_1}{m_2} = \frac{a_2}{a_1}, \qquad m_1 a_1 = m_2 a_2 = F.$$

Newton called this invariant of variable parameters force and said to measure it in newtons without any exchange interaction. Let us immediately note that in dynamic $(\varphi \neq const)$space-matter, all the Evolution Criteria of the space of velocities, and in Riemannian space too: $\boldsymbol{e_i}(x^n) = \boldsymbol{v_i},$ $\boldsymbol{e_k}(x^n) = \boldsymbol{v_k}, \boldsymbol{g_{ik}}\ (x^n) \equiv \boldsymbol{v^2},$ as a potential in the coordinate -time space of velocities $W^N = K^{+N} T^{-N}$, in multidimensional space-time. For charges PC=q (Y+ =X -) in electric (Y+ =X -) magnetic fields, and masses PC=m (X+=Y-) in gravitational (X+=Y-) mass fields, Maxwell and gravitational equations are derived fields.

$c * rot_Y B(X-) = rot_Y H(X-) = \varepsilon_1 \frac{\partial E(Y+)}{\partial T} + \lambda E(Y+)$ $rot_X E(Y+) = -\mu_1 \frac{\partial H(X-)}{\partial T} = -\frac{\partial B(X-)}{\partial T};$	$c * rot_Y M(Y-) = rot_Y N(Y-) = \varepsilon_2 * \frac{\partial G(X+)}{\partial T} + \lambda * G(X+)$ M(Y-) = $\mu_2 * N(Y-); rot_y G(X+) = -\mu_2 * \frac{\partial N(Y-)}{\partial T} = -\frac{\partial M(Y-)}{\partial T}$

As well as transformations of the relativistic dynamics of the Special Theory of Relativity and quantum relativistic dynamics within the limits of parallelism angles.

$$\overline{X} = \frac{X - WT}{\sqrt{1 - W^2/c^2}}. \quad \overline{T} = \frac{T - \frac{W}{c^2}X}{\sqrt{1 - W^2/c^2}}. \quad \overline{W} = \frac{V + W}{1 + VW/c^2}.$$

$$\overline{K}_Y = \frac{a_{11}K_Y + cT}{\sqrt{1 - W^2/c^2}}, \quad \overline{T} = \frac{K_Y/c + a_{22}T}{\sqrt{1 - W^2/c^2}}, \quad \overline{W}_Y = \frac{a_{11}W_Y + c}{a_{22} + W_Y/c}$$, in conditions, $(a_{22} \neq a_{11}) \neq 1$,

For zero angles of parallelism in the Euclidean axiomatics, with velocities lower than the speed of light $W_Y < c$, there are limiting cases of transition of quantum relativistic dynamics of vector components, $a_{22} = (\cos(\alpha^0 = 0) = 1) = a_{11}$, $a_{22} = 1$, $a_{11} = 1$, $Y = WT$,

$$(\overline{K}_Y = \overline{Y}) = \frac{(a_{11} = 1)(K_Y = Y) \pm WT}{\sqrt{1 - W^2(X-)/c^2}}, \quad \overline{Y} = \frac{Y \pm WT}{\sqrt{1 - W^2/c^2}}, \quad \overline{T} = \frac{K_Y/c + (a_{22} = 1)T}{\sqrt{1 - W^2(X-)/c^2}}$$

In other words, in Euclidean axiomatics it is impossible in principle to create the Quantum Theory of Relativity. Both theories: Special Theory of Relativity and Quantum Theory of Relativity, allow superluminal ($v_i = N^* c$) velocity space:

$$\overline{W_Y} = \frac{c + Nc}{1 + c * Nc/c^2} = c, \qquad \overline{W_Y} = \frac{a_{11}Nc + c}{a_{22} + Nc/c} = c, \text{ For } a_{11} = a_{22} = 1.$$

Already within the framework of such ideas, we will consider “black holes”. In classical physics with the Euclidean axiomatic of space-time, for super massive “black stars” $(M \neq 0)$, with a gravitational radius $R_0 = \frac{2GM}{c^2}$, of any mass in theory. And for the masses

$(M \neq 0) = const,$ inside $(R < R_0)$ such a sphere, there must be a superluminal space of velocities $(v_i > c)$or $(v_i = N * c)$, $(N > 1)$. This does not contradict either the Special Theory of Relativity or the Quantum Theory of Relativity. In the quantum coordinate system of the dynamic $(\varphi \neq const)$ space-matter, we are talking about superluminal space of velocities $v_i = \alpha^{-N} * c$, where $\alpha = 1/137{,}036$ the constant.

But let's return to the laws of classical physics, in which Newton's law of gravity has limits of application, and did not answer the question WHY do masses attract? Studying Maxwell's equations, like electromagnetic fields with Lorentz transformations in two (x_0, y_0, z_0, ct_0)And(x_1, y_1, z_1, ct_1) coordinate systems , and from the laws of conservation of energy, back in 1905, Einstein derived a formula, which we will dwell on in more detail.

Body with non-zero$(m \neq 0)$ mass, emits light with energy (L) in system(x_0, y_0, z_0, ct_0) coordinates, with the law of conservation of energy: $(\mathrm{E}_0 = \mathrm{E}_1 + \mathrm{L})$, before and after radiation. For the same mass, and this is the key point, in another (x_1, y_1, z_1, ct_1)coordinate system the mass $(m \neq 0)$does not change , and we have the law of conservation of energy with $(\gamma = \sqrt{1 - \frac{v^2}{c^2}})$ Lorentz transformations, Einstein wrote in the form $(\mathrm{H}_0 = \mathrm{H}_1 + \mathrm{L}/\gamma)$. Subtracting their difference, Einstein got:

$$(\mathrm{H}_0 - \mathrm{E}_0) = (\mathrm{H}_1 - \mathrm{E}_1) + \mathrm{L}(\frac{1}{\gamma} - 1), \text{ or } (\mathrm{H}_0 - \mathrm{E}_0) - (\mathrm{H}_1 - \mathrm{E}_1) = \mathrm{L}(\frac{1}{\gamma} - 1),$$

With separation of the radiation energy difference. Both inertial coordinate systems are moving, but (x_1, y_1, z_1, ct_1)moving at a speed (v) relatively (x_0, y_0, z_0, ct_0). And it is clear that blue and red light have an energy difference, which Einstein wrote down in the equation. Einstein wrote down the equation itself as the difference in kinetic energies in the first expansion.

$$(\mathrm{K}_0 - \mathrm{K}_1) = \frac{\mathrm{L}}{2}(\frac{v^2}{c^2}..) , \qquad \text{or} \qquad \Delta\mathrm{K} = (\frac{\Delta\mathrm{L}}{c^2})\frac{v^2}{2}$$

Here $(\frac{\Delta\mathrm{L}}{c^2} = \Delta m)$the multiplier has the properties of the “radiant energy” mass, or: $\Delta\mathrm{L} = \Delta mc^2$. This formula has been interpreted in different ways. The annihilation energy of $\mathrm{E} = \mathrm{m}_0 c^2$the rest mass, or: ${\mathrm{m}_0}^2 = \frac{E^2}{c^4} - p^2c^2$, in relativistic dynamics. Here is the mass with zero momentum$(p = 0)$, has energy: $\mathrm{E} = \mathrm{m}_0 c^2$, and the zero mass of the photon: $(\mathrm{m}_0 = 0)$, has momentum and energy $\mathrm{E} = \mathrm{p} * \mathrm{c}$. But Einstein derived another law of “radiant energy” $(\Delta\mathrm{L} = \Delta mc^2)$, with mass properties. This is not the energy of a photon, and this is not the energy of $(\Delta E = \Delta mc^2)$a defect in the mass of nucleons in the nucleus of an atom. Einstein saw something that no one else saw. Like a moving charge, with the magnetic field induction of Maxwell's equations, a moving mass (the mass $(m \neq 0)$does not change), induces mass energy $(\Delta\mathrm{L} = \Delta mc^2)$, which is what Einstein found. For example, a charged sphere (the charge $(q \neq 0)$does not change), inside a moving carriage has no magnetic field. But the compass on the platform will show the magnetic field of the sphere in the moving carriage. It was precisely this kind of inductive magnetic field, from the moving electrons of a conductor current, that Oersted discovered. Then there were Faraday's experiments, the induction of vortex electric fields in an alternating magnetic field, the laws of induction and self-induction, and Maxwell's equations. By analogy with the inductive energy of a magnetic field from a moving charge, Einstein derived the formula for the inductive, “radiant” energy of mass fields from moving non-zero masses, including stars in galaxies. And here Einstein went beyond the Euclidean $(\varphi = 0)$ axiomatics of space-time. In the axioms of dynamic space-matter $(\varphi \neq const)$, we are talking about inductive $m(Y -)$mass fields, in complete analogy with Maxwell's equations. This is what Einstein saw, and no one else. Already from the Equivalence Principle, the potential of the inductive mass field: $v^2(Y - X+) = v * cos\varphi_x(X+) * v * cos\varphi_x(X+) = Gv^2(X+)$ in a gravitational field, a constant follows $(G = cos^2\varphi_x)$as a mathematical truth. And already writing the equation of the General Theory of Relativity, Einstein took the gravitational potential of zero mass: $\frac{E^2}{p^2} = c^2$, in the form of $\frac{L^2(Y-)}{p^2} = Gv^2(X+) = \frac{8\pi G}{c^4}T_{ik}$ an energy-momentum tensor. A misconception about Einstein's General Theory of Relativity is that it is believed that non-zero mass is represented in the equation as the source of space-time curvature, as the source of gravity. In the equation of Einstein's General Theory of Relativity, as a mathematical truth in dynamic space-matter in its entirety:

$$R_{ik} - \frac{1}{2}Rg_{ik} - \frac{1}{2}\lambda g_{ik} = \frac{8\pi G}{c^4}T_{ik}.$$

There is no mass: $(M = 0)$, in its classical sense. In mathematical truth, this is the difference in relativistic dynamics at two fixed points in Riemannian space, one of which is reduced to the Euclidean sphere, in the external, non-stationary $(\lambda \neq 0)$ Euclidean space-time. In physical truth, in the equation of the General Theory of Relativity, Einstein, in the unified Criteria of Evolution, Newton's formula (law) is "hardwired":

$$E = c^4K,\ P = c^4T,\ \left(c_i^2 - c_k^2 = \Delta c_{ik}^2\right) = \frac{E^2}{p^2} = \left(\frac{K^2}{T^2} = c^2\right), \quad \Delta c_{ik}^2 = Gv^2(X+) \neq 0$$

$$\Delta c_{ik}^2 = \frac{c^4c^4K^2}{c^4c^4T^2} = \frac{G(c^2K_Y = m_1)(c^2K_Y = m_2)}{c^2(c^2T^2 = K^2)} = \frac{Gm_1m_2}{c^2K^2}, \qquad \Delta c_{ik}^2 = \frac{Gm_1m_2}{c^2K^2}, \qquad \Delta c_{ik}^2c^2 = F$$

As we see, in the equation of Einstein's General Theory of Relativity, the force of gravity acts in fields with zero mass. It reads: the difference in mass flows $\Delta c_{ik}^2(Y-)$in the external field of gravity $c^2(X+)$, with their Principle of Equivalence, gives strength. And only now, we will consider the properties of "super massive" $(M \neq 0)$ compact $(R \to 0)$ objects discovered in the galactic core as a fact of rarity.Under the conditions of: $c^2 = (\frac{2G(M=0)}{(R=0)} = 0) \neq 0$, under the conditions of the Planck limit length (10^{-33} *см*), of the quantum field in space-time, under the conditions of the uncertainty principle, as well as the always dynamic one, of the quantum itself, under the conditions of a non-zero difference

$$R_{ik} - \frac{1}{2}Rg_{ik} \neq 0$$

energy-momentum tensor , i.e. $(T_{ik} \neq 0)$ energy, the presence of: $c^2 = (\frac{2G(M=0)}{(R=0)} = 0) \neq 0$ gravitational potential as the reason for the curvature of the "black hole" space itself, outside the mass. The concept of "event horizon" arises in the basic solutions of Schwarzschild, the relativistic metric of the gravitating sphere, as the initial state. There are key transformations of the simplified mathematical model of the Einstein equation that lead to Schwarzschild solutions, but already in the gravitational field of space-matter outside the mass.

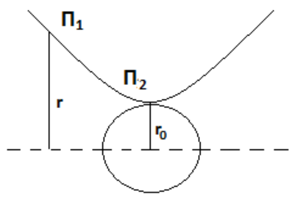


Fig.4c – gravitational potentials

Einstein's equation: $R_{ik}(1) - \frac{1}{2}Rg_{ik}(2) = \frac{8\pi G}{c^4}T_{ik}$: we write in the form of gravitational potentials at two points of Riemannian space with a fundamental tensor:

$$R_{ik}(1) = e_i(x^n)e_k(x^n) = v_iv_k = \Pi_1 \qquad \text{and} \qquad g_{ik}(2) = e_i(x^n)e_k(x^n) = v_iv_k = \Pi_2$$

We understand that point (2) is represented by Euclidean space (r_0)without curvature. Note that the exact coincidence of point (2) of the curve with the circle is not in the mathematical truth of the full Einstein equation. Point (1) with curvature of Riemannian space (r) in a gravitational field. Then we will represent the gravitational potentials outside the masses in the form:

$$\Pi_1 = c^2(\frac{r}{r})^2, \quad \Pi_2 = c^2(\frac{r_0}{r})^2,$$ with the energy-momentum tensor:

$$\frac{8\pi G}{c^4}T_{ik} = \frac{E^2}{p^2} = \frac{G(\Pi^2K)^2}{(\Pi^2t)^2} = \frac{G\Pi^2\Pi^2K^2}{c^4\Pi^2t^2},$$

$$\Pi_1 - \Pi_2 = \frac{G\Pi^2 K^2}{c^4 t^2} = \frac{Gc^2 \Pi K^2}{c^2 \Pi t^2}, \qquad \Pi_1 - \Pi_2 = \frac{c^2 G K^2}{c^2 t^2}, \text{ or:}$$

$$c^2(\frac{r}{r})^2 - c^2(\frac{r_0}{r})^2 = \frac{c^2 G K^2}{c^2 t^2}, c^2(1 - \left(\frac{r_0}{r}\right)^2) = \frac{c^2 G K^2}{c^2 t^2}, \qquad (1 - \left(\frac{r_0}{r}\right)^2) = \frac{x^2}{c^2 t^2},$$

$$\left(1 + \frac{r_0}{r}\right)\left(1 - \frac{r_0}{r}\right) = \frac{x^2}{c^2 t^2}, \left(1 + \frac{r_0}{r}\right) c^2 t^2 - \frac{x^2}{\left(1 - \frac{r_0}{r}\right)} = s^2(x), s^2(x) = 0 \text{at } (x = 0).$$

$$\left(1 + \frac{r_0}{r}\right) c^2 t^2 - \left(1 - \frac{r_0}{r}\right)^{-1} x^2 = s^2, \text{ or: } \quad ds^2 = \left(1 + \frac{r_0}{r}\right) c^2 dt^2 - \left(1 - \frac{r_0}{r}\right)^{-1} dx^2.$$

These are the mathematical truths of the simplest model of radial relativistic space-time dynamics in a gravitational field without $(m_0 = 0)$mass: $\frac{E^2}{p^2} = c^2$, or: $\frac{E^2}{c^2} = p^2 + (m_0 = 0)^2 c^2$. And the first thing to note is the non-zero $(r_0 \neq 0)$radius by definition. This is the radius of a circle instead of a sphere in the Schwarzschild solution. And this is the condition $(Rg_{ik} \neq 0)$ of the Einstein equation, as a mathematical truth in its full form. Here, talking about singularity is talking about nothing. There is no singularity in principle and by definition. The second point is that the Einstein equation considers gravity outside the sphere. There are no "travels" inside the sphere in the Einstein equation either, as in Newton's law $(r \neq 0)$. All subsequent models of "black holes" have an event horizon, and so on. Many models of "black holes", collapsing photon spheres (stars in the limit) passing the Schwarzschild sphere, their diagrams are naive, erroneous in the basic foundations and without arguments of the initial premises as causes, although mathematics and logic work further. But Einstein's equation is not about this at all. Einstein's equation does not contain mass $(m = 0)$and is deeper. It specifies the potentials, force fields and energy of the gravitational field at any point in the Universe outside of mass $(m = 0)$. And not a single model answers the question, WHY does the curvature of gravity arise and where does the energy of the field come from? In such listed conditions, as arguments of mathematical truths, to talk about a singularity in the center$(R = 0)$ "black hole", this is a conversation about nothing. There is no singularity in the center of "black holes". The question is closed.

But there is a fact of the presence of "super massive compact objects" discovered in the core of galaxies. And there is another representation of the properties of such objects:

$$(R < R_0) = \frac{2GM}{(v_i > c)^2}$$

with the presence of superluminal space: $(v_i > c)$inside $(R < R_0)$such "black spheres" called "black holes". There are no "holes". The mass of such "black spheres" $(M \neq 0)$is not zero. Next we will talk about the properties of "black spheres" called "black holes", within the framework of the properties of dynamic space - matter (https://vixra.org/abs/2302.0022) which are subject to experimental testing. First of all, the presence of new quanta in the cores of planets, in the cores of stars, in the cores of galaxies, in the cores of quasars and in the cores of quasar galaxies. And first of all, stable quanta of the new substance.

On colliding beams of positrons (e^+), which are accelerated in a stream of quanta $(Y- = \gamma)$, photons of **a "white" laser** in the form of:

$$\text{НОЛ}(X \pm = p_1^+) = (\boldsymbol{Y}-= e^+)(X+= v_\mu^-)(\boldsymbol{Y}-= e^+) = \frac{2m_e}{G} = 15{,}3\ TeV,$$

On colliding beams of antiprotons (p^-), occurs:

$$\text{НОЛ}(Y \pm = e_2^-) = (\boldsymbol{X}-= p^-)(Y+= e^+)(\boldsymbol{X}-= p^-) = \frac{2m_p}{\alpha^2} = 35{,}24\ TeV.$$

indivisible and stable quanta of matter, similar to the substance of electron quanta.

We are talking about a quantum coordinate system $0Л_{ji}(m - n)$in the space-matter of the Universe, in each $0Л_j$level $0Л_i$there are three $(X-= Y+)$charge and two $(Y-= X+)$mass isopotentials. And in this quantum coordinate system, "heavy "(p_j/e_j) quanta, each of which has its own "depth" of energy levels(v_1/γ_i) quanta of physical vacuum. Let's imagine them in the form of models such $R_{ji}(m)$ Indivisible Regions of space - the matter of the Universe.

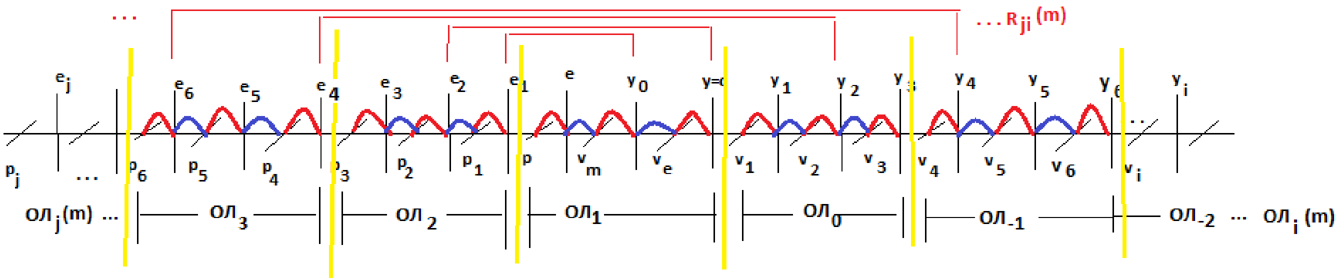


Fig.5. spectrum of indivisible quanta

This is a certain sphere in space-matter, in the center of which are “heavy”(p_j/e_j) quanta that determine “down” and “up” along the radius, up to the level(ν_i/γ_i) quanta of the physical vacuum of space-matter of the Universe, for any similar object within this sphere.

In the axioms of dynamic space-matter, $\text{НОЛ} = \text{КЭ}(m)\text{КЭ}(n) = 1$, we obtain for the masses (M) of indivisible quanta in (ОЛ_{ji}) levels:

$$\text{НОЛ} = M(e_1 = 1{,}15\ \text{E}4\ )(k = 3.13)M(\gamma_0 = 3.13.\text{E} - 5\ ) = 1$$
$$\text{НОЛ} = M(e_2 = 3{,}524\ \text{E}7\ )(k = 3.13)M(\gamma = 9{,}07\ \text{E} - 9\ ) = 1$$
$$\text{НОЛ} = M(e_3 = 5{,}755\ \text{E}11\ )(k = 3.86)M(\gamma_1 = 4.5.\text{E} - 13\ ) = 1$$
$$\text{НОЛ} = M(e_4 = 1{,}15\ \text{E}16\ )(k = 3.13)M(\gamma_2 = 2{,}78\ \text{E} - 17\ ) = 1$$
$$\text{НОЛ} = M(e_5 = 3{,}97\ \text{E}19\ )(k = 3.13)M(\gamma_3 = 8.05.\text{E} - 21\ ) = 1$$
$$\text{НОЛ} = M(e_6 = 6{,}48\ \text{E}23\ )(k = 3.83)M(\gamma_4 = 4{,}03\ \text{E} - 25\ ) = 1$$
$$\text{НОЛ} = M(e_8 = 4{,}47\ \text{E}31\ )(k = 3.14)M(\gamma_6 = 7{,}13\ \text{E} - 33\ ) = 1$$

....

$$\text{НОЛ} = M(e_{26} = 9{,}1\ \text{E}103\ )(k = 3.14)M\left(\gamma_{24} = 3{,}5\ \text{E} - 105\ \right) = 1$$

Obviously, we are talking about vortex mass $(Y-)$trajectories: $\text{c} * rot_X M(Y- = \gamma_i) = \varepsilon_2 * \frac{\partial G(\text{X}+)}{\partial T} + \lambda * G(\text{X}+)$ equations of dynamics in a circle $(k = 3.14 = \pi = \frac{2\pi R = l}{2R})$ in each (ОЛ_i) level of the physical vacuum. These are spheres around a planet, star, galaxy, quasar... . Using quanta as an example:

$$\text{НОЛ}(X \pm = p_1^+) = (\boldsymbol{Y}- = e^+)(X+ = \nu_\mu^-)(\boldsymbol{Y}- = e^+) = \frac{2m_e}{G} = 15{,}3\ TeV,$$
$$\text{НОЛ}(Y \pm = e_2^-) = (\boldsymbol{X}- = p^-)(Y+ = e^+)(\boldsymbol{X}- = p^-) = \frac{2m_p}{\alpha^2} = 35{,}24\ TeV\ ,$$

we are talking about the synthesis of matter $(X \pm = p_1^+)$using colliding beams$(e^+e^+ \to p_1^+)$ positrons with virtual quanta (ν_μ^-), and$(Y \pm = e_2^-)$ on counter beams$(p^-p^- \to e_2^-)$ antiprotons and positrons with virtual quanta (e^+)similar to electrons $(e^- = \nu_e^-\gamma^+\nu_e^-)$. We can also talk about the consistent synthesis of “heavy”(p_j/e_j) quanta, namely substances $(X\pm = p_j^+)$, for $(Y-)_A$the $(X-)_A$apparatus, in individual processes. $(\ldots \leftarrow p_6^+ \leftarrow e_5^+ \leftarrow p_3^+ \leftarrow e_2^+ \leftarrow p^+)And(\ldots \leftarrow p_7^+ \leftarrow e_6^+ \leftarrow p_4^+ \leftarrow e_3^+ \leftarrow p_1^+ \leftarrow \boldsymbol{e}^+)$ synthesis. The important thing is that the electron (e^-) emits and absorbs a photon (γ^+), but it cannot emit and absorb a "dark" photon (γ_0). This "dark" photon is emitted and absorbed by a "heavy" electron $(e_1) \to (\gamma_0\ )$. In exactly the same way, a “heavy” proton $(p_1) \to (\nu_\mu\ )$emits and absorbs a muon neutrino. These are invisible quanta that do not interact and are non-contact with quanta (p^+/e^-) atoms of the periodic table. We can neither see nor record them. But these invisible quanta (blue color in the indicated sequences) have charge isopotentials and can form Structural Forms that are invisible to us, similar to ordinary (p^+/e^-) atoms. These are: structures (ν_μ/γ_0), (p_1/e_1)... This is how we consistently master the potentials of the core of planets, the core of stars, the core of galaxies and the core of quasars. But for $(Y-)_A$ apparatus, we can only form contact quanta (p_4^+) galactic nuclei and quanta (p_6^+) substances of the core of quasars. And the device itself $(Y-)_A$, is consistently “immersed” in a physical vacuum, such as: $\text{НОЛ} = (e_4\ )(k)(\ \gamma_2\ ) = 1$, $\text{НОЛ} = (e_6\ )(k)(\ \gamma_4\ ) = 1$, superluminal $(\gamma_2 = 137 * c\ )$, and$(\gamma_4 = 137^2 * c\ )$ velocity space. This is completely acceptable in Special $\overline{W_Y} = \frac{c+Nc}{1+c*Nc/c^2} = c$, and Quantum $\overline{W_Y} = \frac{a_{11}Nc+c}{a_{22}+Nc/c} = \text{c}$,Theories of Relativity in Euclidean

$a_{ii} = \cos(\varphi = 0)$, $a_{11} = a_{22} = 1$, angles of parallelism . The apparatus itself $(Y-)_A$moves in the indicated sphere of space-matter of the Universe, in various levels of physical vacuum. It is worth noting that the volume of space-matter of a star is "immersed" in velocity space ($\gamma = c$), the volume of galaxies is "immersed" in velocity space ($\gamma_2 = 137 * c$), the volume of quasars is "immersed" in space($\gamma_4 = 137^2 * c$) already superluminal speeds.

3. Admissible objects of the Universe

We will call the objects of the Universe "spheres-points"$0Л_{ji}(n)$ convergence, in each fixed "point $0Л_{ji}(m = const)$" quantum coordinate system. For example, objects:

$$НОЛ = M(e_2 = 3{,}524\ \mathrm{E}7\ )(k = 3.13)M(\gamma = 9{,}07\ \mathrm{E} - 9\ ) = 1$$

similar to the kernel (p/e) ordinary atoms, we are talking about quanta(p_2/e_2) star cores. Stars with such a core have the maximum energy level of a physical vacuum, at the level (γ)photon. Below the photon energy, the star does not manifest itself in a physical vacuum. Similar to proton radiation $(p^+ \to \nu_e^-)$ antineutrino, we are talking about radiation from antimatter matter and vice versa. That is: $(p_8^+ \to p_6^-)$, $(p_6^- \to p_4^+)$, $(p_4^+ \to p_2^-)$, $(p_2^- \to p^+)$, with the corresponding atomic nucleus : (p^+/e^-) substances of an ordinary atom,(p_2^-/e_2^+) antimatter core of the "stellar atom",(p_4^+/e_4^-) matter of the core of the galaxy, (p_6^-/e_6^+)antimatter of the core of the quasar and " (p_8^+/e_8^-)matter of the core of the "quasar galaxy". Further, we proceed from the fact that quantum(e_{*1}^-) substances $(Y- = p_1^-/n_1^- = e_{*1}^-)$ planetary cores emits a quantum

$$(e_{*1}^+ = 2 * \alpha * (p_1^- = 1{,}532E7\ MeV)) = 223591MeV, \quad \text{or:} \quad \frac{223591}{p=938{,}28} = e_*^+ = 238{,}3 * p$$

mass of the uranium nucleus, quantum of "antimatter" $M(e_*^+) = M(238{,}3 * p) = {}^{238}_{92}U$, uranium nuclei. There is such an "antimatter"$(e_*^+ = {}^{238}_{92}U = Y-)$ unstable, and decays exothermically into a spectrum of atoms in the core of planets.

At superluminal level $w_i(\alpha^{-N}(\gamma = c))$ physical vacuum, such stars do not manifest themselves. Next, we are talking about the substance of $(p_3^+ \to p_1^-)$the nucleus$(Y- = p_3^+/n_3^0 = e_{*3}^+)$ "black spheres" around which, in their gravitational field, globular clusters of stars form. Similarly, below, we are talking about radiation from antimatter matter and vice versa: $(p_6^+ \to p_5^-)$, $(p_5^- \to p_3^+)$, $(p_3^+ \to p_1^-)$, $(p_1^- \to \nu_\mu^+)$. The general sequence looks like:

$$p_8^+, p_7^+, p_6^-, p_5^-, p_4^+, p_3^+, p_2^-, p_1^-, p^+, \nu_\mu^+, \nu_e^- \ ....$$

Further: $НОЛ = M(e_4 = 1{,}15\ \mathrm{E}16\ )(k = 3.13)M\big(\gamma_2 = 2{,}78\ \mathrm{E} - 17\ \big) = 1$. These quanta (p_4/e_4) galactic nuclei are surrounded by individually emitted quanta(p_2/e_2) the cores of stars are the reason for their formation. Such galactic nuclei, in the equations of quantum gravity, have spiral arms of mass trajectories, already: $w_i(\gamma_2 = \alpha^{-1}\mathrm{c}) = 137 * \mathrm{c}$, in superluminal speed space. Below the energy of light photons $(w_i = 137 * \mathrm{c})$in a physical vacuum, galaxies do not manifest themselves. Outside galaxies, we are talking about quanta from the core of mega stars $(Y- = p_5^-/n_5^- = e_{*5}^-)$. They generate many quanta$(e_{*5}^- = 2 * \alpha * p_5^- = e_{*4}^+ = 290p_4^+)$ galactic nuclei. Likewise further.

$$НОЛ = M(e_6 = 6{,}48\ \mathrm{E}23\ )(k = 3.83)M\big(\gamma_4 = 4{,}03\ \mathrm{E} - 25\ \big) = 1$$

We're talking about quanta$(Y- = p_6^-/n_6^- = e_{*6}^-)$ quasar nuclei, which also individually emit(p_4/e_4) quanta of the core of galaxies. In other words, the quasar core is surrounded by quanta from the galactic core. They say that the quasar is in the center of the galaxy. Such quasars plunge into the level of physical vacuum to superluminal speeds $w_i(\gamma_4 = \alpha^{-2}\mathrm{c}) = 137^2 * \mathrm{c}$. This is deeper than the level of the physical vacuum of the galaxy. These are completely different objects. In other words, quasars bend space-matter at the level(γ_4) quanta Next we talk about quanta of matter kernels $(Y- = p_7^+/n_7^0 = e_{*7}^+)$ "black spheres" around which, in their gravitational field, clusters of galaxies are formed, and further:

$$НОЛ = M(e_8 = 4{,}47\ \mathrm{E}31\ )(k = 3.14)M\big(\gamma_6 = 7{,}13\ \mathrm{E} - 33\ \big) = 1$$

We're talking about quanta(p_8/e_8) the nuclei of quasar galaxies, which also individually emit quanta$(p_6^-/n_6^- = e_{*6}^-)$ quasar cores. Such quasar galaxies plunge into the level of physical vacuum to superluminal speeds $w_i(\gamma_6 = \alpha^{-3}c) = 137^3 * c$. Similarly further.

In the axioms НОЛ = КЭ(m)КЭ$(n) = 1$, or $M_j(X+) * M_i(Y-) = 1$, of dynamic space-matter, we are talking about the source of gravity gravitational$M_j(X+)$ mass in $ОЛ_j$ levels and inert $M_i(Y-)$ mass in $ОЛ_i$ levels of physical vacuum, with their Einstein equivalence principle in a single gravitational $(X+ = Y-)$ mass field. These masses: $M_j * M_i = (M = ПК)^2 = 1$, in the form of a quadratic form, are presented in the quantum fields of their interaction:

$$\hbar = Gm_0\frac{\alpha}{c}Gm_0(1-2\alpha)^2 = GM_j\frac{\alpha}{c}GM_i(1-2\alpha)^2 = \frac{(6{,}674*10^{-8})^2*(1-2/(137.036))^2}{137.036*2.993*10^{10}} = 1.054508*10^{-27}$$

in quantum: $G(X+)\left[\frac{K}{T^2}\right] = \psi\frac{\hbar}{П^2\lambda}G\frac{\partial}{\partial t}grad_n Rg_{ik}(X+)\left[\frac{K}{T^2}\right]$, gravit $(X+ = Y-)$ mass fields . This equation of quantum gravity follows directly from the equation of Einstein's General Theory of Relativity. Thus, the maximum mass$M_j(X+)$ source of gravity is determined by $M_i(Y-)$the inertial mass of mass $(Y- = \gamma_i)$ fields in $ОЛ_i$ levels of physical vacuum, like an object$ОЛ_{ji}(n)$ convergence or: НОЛ $= ОЛ_{ji}(n) = M_j(X+) * M_i(Y- = \gamma_i) = 1$. Thus, we obtain the maximum masses in the Universe: for example, for a star$M_j(X+) = M_2(p_2^-/n_2^0) = 1/(\gamma)$ in conditions$(e_2^+(k)\gamma) = 1$. Likewise:

Limit mass of planets, for $1MeV = 1.78*10^{-27}g$:

$$\frac{1}{\gamma_0} = \frac{1}{3.13*10^{-5}MeV*1.78*10^{-27}g} = M_1(p_1^-/n_1^-) \approx 1.8*10^{31}g \approx \frac{M_s}{100}$$, where $(M_s = 2*10^{33}g)$ is the mass of the Sun. Next is the maximum mass of stars with a core of antimatter:

$$\frac{1}{\gamma} = \frac{1}{9.07*10^{-9}MeV*1.78*10^{-27}g} = M_2(p_2^-/n_2^-) \approx 6.2*10^{34}g \approx 31M_s$$, or ranging from $\frac{M_s}{100}$ before $31M_s$ масс.

Similarly, the maximum mass$(p_3^+/n_3^0 = e_{*3}^+)$ “black spheres”, with a core of matter:

$$\frac{1}{\gamma_1} = \frac{1}{4.5*10^{-13}MeV*1.78*10^{-27}g} = M_3(p_3^+/n_3^0) \approx 1.25*10^{39}g \approx 625220M_s$$

maximum mass of the galaxy,$(p_4^+/n_4^0 = e_{*4}^+)$ with a core of matter:

$$\frac{1}{\gamma_2} = \frac{1}{2.78*10^{-17}MeV*1.78*10^{-27}g} = M_4(p_4^+/n_4^0) \approx 2*10^{43}g \approx 10^{10}M_s$$

the maximum mass of an extragalactic megastar,$(p_5^-/n_5^- = e_{*5}^-)$ with an antimatter core:

$$\frac{1}{\gamma_3} = \frac{1}{8.05*10^{-21}MeV*1.78*10^{-27}g} = M_5(p_5^-/n_5^-) \approx 7*10^{46}g \approx 3{,}5*10^{13}M_s,$$

the maximum mass quasar, $(p_6^-/n_6^- = e_{*6}^-)$ with an antimatter core:

$$\frac{1}{\gamma_4} = \frac{1}{4.03*10^{-25}MeV*1.78*10^{-27}g} = M_6(p_6^-/n_6^-) \approx 1{,}4*10^{51}g \approx 7*10^{17}M_s,$$

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Each core of such objects$ОЛ_{ji}(n)$ convergence, generates a set of corresponding quanta $(2*\alpha*p_j^\pm = e_{*j}^\mp = N\,p_{j-1}^\mp)$indicated in the table, and emits $(p_j^\pm \to p_{j-2}^\mp)$. This is a lot (N) quanta of the core of planets, stars, galaxies, quasars….

For example, the core of the Sun, like a star, emits hydrogen nuclei$(p_2^- \to p^+ \to \nu_e^-)$ and electron antineutrino, but generates$(2*\alpha*p_2^- = e_{*2}^+ = N\,p_1^+)$ quanta of, let’s say, “stellar matter”(p_1^+/e_1^-) in the solid surface of the star. This is "star stuff"(p_1^+/e_1^-) cannot interact with hydrogen (p^+/e^-), but can emit muon antineutrino $(p_1^+ \to \nu_\mu^-)$, which in the Earth’s atmosphere forms muons, which in decays give: (e^+) positrons: $(Y\pm = \mu) = (X- = \nu_\mu^-)(Y+ = e^+)(X- = \nu_e^-)$. Or, quanta core of a mega star with$(p_5^-/n_5^- = e_{*5}^-)$ emit quanta $(p_5^- \to p_3^+)$of matter, but generate quanta from the nuclei of galaxies $(2*\alpha*p_5^- = e_{*5}^+ = N\,p_4^+)$. We see, as it were, the “surface” of the galaxy, but the core of such an object$ОЛ_{ji}(n)$ convergence, has a mass ranging from$(10^{10}M_s)$ before$(3.5*10^{13}M_s)$ mass of the Sun.

We are talking about valid objects$ОЛ_{ji}(n)$ convergence, in the dynamic space-matter of the Universe. In this case, the calculated cause-and-effect relationships are indicated.

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