Proceeding Paper

Monism of Nonlocal Matterspace with Instant All-Unity Instead of Particle–Field Duality with Retarded Interactions †

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Abstract: The metric self-organization of matterspace–time implies a nonlocal correlation of its affine connections and the fulfillment of the volumetric conservation of energy–momentum under shifts in coordinate time. Geodesic forces or accelerations in metric fields of general relativity correspond to local pushes by the Lomonosov gravitational liquid but not to the retarded interactions between distant bodies. The mathematics of Russian Cosmism for the monistic all-unity of ethereal matter–space with the continuous distribution of mass–energy replaces Newtonian gravity ‘from there to here’ with the local kinetic stresses ‘from here to there’ due to the spatial asymmetry of inertial densities within a nonlocal whole. The inverse square law for ethereal pushes of concentrated (visible) masses can be controlled locally by a subtle resonant intervention into their polarized densities.

Keywords: mobile ether; kinetic monism; metric inertia; self-acceleration; instant correlations; advanced wave; nonlocal mass–energy; telekinesis

1. Introduction

The dual world of Newtonian massive bodies and massless fields for mutual forces in the void created the Standard Model of modern physics with unrealistic field mediators between the inertial particle sources. In the teaching Russian Cosmism, the alternative approach to the monistic all-unity of material space dominated two centuries after Lomonosov’s ethereal works [1,2]. The first president of the Russian Academy of Sciences qualitatively argued that invisible matter–liquid (or superpenetrating ether) can exert local pressure to accelerate both partners in the observable phenomenon of gravity. This ethereal physics of old Russian cosmists culminated quantitatively in the Umov law for the vector transfer of inertial energy with the reversible transfer of accompanying thermal and ethereal densities. In 1873, the revolution rest energy or latent kinetic chaos was claimed by Umov for his mobile ether (E_Umov ≡ kmc^2 ∼ mc^2 − mv^2/2 ≥ c^2/2) with the reversible return to mc^2 after the end of motion [3].

Pro-Western dualist Lev Landau (1908-1968) and his theoretical school did not perceive the ethereal monism of Russian thinkers where dynamical order could be restored from chaos, and since the late 30s, the ethereal macrophysics of Russian cosmists with reversible densities of mass–energy κ(v)mc^2 in the kinetic (monistic) space medium has been squeezed out of domestic journals. The material distribution of each elementary mass over the entire space became admissible in the USSR only for the quantum models of foreign scholars. The extended particle method in the celebrated Vlasov–Maxwell equation for self-consistent plasma dynamics has also suffered an unprecedented defeat from domestic academicians as a pseudoscience [4]. Since then, the monistic worldview of Russian cosmism has ceased to interest physical journals. The surviving supporters of Umov’s mobile ether and chaos–order mutual transformations in the world material space (without emptiness) were forced to publish only abroad.
The purpose of this brief note is to redirect the Russian Academy of Sciences toward the ontological advantages of the monistic ether matter of Russian thinkers instead of the dualistic Standard Model of particles and field mediators. The monistic theory can claim the equilibrium equipartition for kinetic energy distributions over competitive degrees of freedom:—inward chaos and translational order. Monism can clarify ‘how’ and ‘why’ gravitating bodies reversibly bounce in metric organizations of spacetime without the gravitational collapse [5]. Dualism can only describe ‘how’ distant bodies should collapse without understanding ‘why’. The Euler/Navier–Stokes equation erroneously relies on the Newtonian collinearity of accelerations and external forces. These dualistic mechanics only work for volumetric bodies in empty space and not for the tensor self-organization of correlated densities in a nonlocal whole. Simple hydro-dynamical probes with laboratory fluids can falsify such a dualistic worldview in favor of the monistic all-unity of continuous inertia with nonlocal turbulence [6].

The unique significance of Russian Cosmism will emerge after a monistic reinterpretation of the physical reality instead of the dual concept of kinetic and potential energies. Sooner or later, macrophysics and cosmology will return to the kinetic all-unity of continuously distributed ethereal densities of the Lomonosov–Umov space medium or matterspace in its relativistic updates of ethereal physics. Below we will trace how such matterspace with instantaneously correlated stresses can maintain the ethereal nature of the inverse square law, first proposed by Hook and Newton for separated bodies in a void. Nonlocal all-unity of matterspace suggests controlling the “first fundamental force” locally through subtle interventions in the spatial asymmetry of material densities.

2. Monistic Approach to Metric Spacetime

Negative energies should not exist at all in the kinetic reality of measurable (positive) energies of Russian Cosmism. Similarly, non-kinetic fractions of energy should not be employed in the 1644 approach of Descartes to the endless motion of inertial vortexes with local pushes or mechanical stresses within matter extension. The negative gravitational energy for pulling attractions of Newton appeared as a palliative notion prior to the local metric push in the 1914 geodesic relationships of Einstein.

Akasha, Prana, and other Sanskrit terminology seem too sophisticated for the matterspace mathematics of the author. Nonetheless, connoisseurs of Vedic science could find suitable intersections for their thermal and vital energies with the cosmic thinking of Lomonosov, Umov, Tsiolkovsky, Vernadsky, Chizhevsky, and others, who also developed the monistic all-unity of geosphere, biosphere, and noosphere. The monism of kinetic energies conceptually rejects the Newtonian action-at-a-distance with negative (nonexistent) gravitational energy. Lomonosov replaced distant attractions from “there to here” with local pushes from “here to there”. Shortly, the action on probe bodies in measurements is always local, while the monistic matterspace self-organization is always nonlocal.

The monistic mechanics of kinetic energy with Umov’s mobile ether can draw a lot from Einstein’s physics due to the amazing finding of Kuhn: “Einstein’s theory can be accepted only with the recognition that Newton’s was wrong” [7]. Unlike Newton, Einstein’s metric energies never relied on negative potentials. Special relativity (SR) introduced positive (kinetic) rest energy $mc^2$ and allowed general relativity (GR) to operate with only one, monistic product, $mc^2 \sqrt{g_{oo}/(1−β^2)}$, but not with the formal sum of competing for kinetic and gravitational energies in the dual model of Newton. GR does not work with negative mechanical energies and, using the Machian ideas, can self-consistently replace Newtonian duality with the monistic references for material space medium [8]. Gravitational energy should not be postulated as an independent notion when kinetic energies determine accelerations or decelerations of geodesic bodies in the metric organization of spacetime [5]. The mathematical challenge to Russian Cosmism lies in the quantitative description of the nonlocal world hierarchy of quasi-stable systems through inertial matterspace in physics, hydrodynamics, astronomy, engineering, biosciences, and informatics.
3. Shannon’s Potential for the Distribution of Information and Shaping of Densities

There is no empty space between material peaks in the monistic continuum of inertial mass–energy. The self-organized shaping of spatial densities locally adjusts the adaptive time rate \( \frac{d}{dt} \equiv g_{sys} \frac{d x^\mu}{c \sqrt{\gamma}} \equiv g_{sys} \frac{d x^\mu}{c} \) to maintain metric correlations and information exchanges in Euclidean 3-section of the pseudo-Riemann matterspace–time. The static potential \( W(r) \equiv \varphi_q \ln g_{sys} = -\varphi_q \ln [1 + G m/rc^2] \) in equilibrium matterspace with radial densities \([5,8]\) corresponds to the Shannon optimal potential \( C(N) = \pm w \ln [1 + P/wN] \) for incoming/outgoing information flows \([9,10]\). This logarithmic analogy with similar arguments \( P/wN \) and \( \sqrt{Gm^2/r} \varphi_q \) clarifies the inertial charge self-potential \( \varphi_q = c^2/\sqrt{G} \) as the energy-information bandwidth \( w \). A static multipiek density of metric fields and corresponding mass–energy densities can be also described by the Shannon logarithmic rate for information from multiple sources \( P_k \):

\[
C_{sys} = \pm w \ln \left( 1 + \frac{1}{w} \sum_{k}^n \frac{P_k}{N_k} \right) \quad \text{or} \quad W_{sys}(\vec{x}) = -\varphi_q \ln \left( 1 + \frac{1}{\varphi_q} \sum_{k}^n \sqrt{\frac{Gm_k^2}{x - \vec{a}_k}} \right).
\]

(1)

To describe the metric self-assembly of nonlocal matter–space with a multipiek density of ‘elementary’ mass energies \( m_k c^2 = m_k \sqrt{G} \varphi_q \equiv \varphi_k \varphi_q^2 \), we first derive the local mechanical strength \( E_{sys}(\vec{x}) \) from the build of Shannon information (1),

\[
E_{sys}(\vec{x}) \equiv -\varphi W_{sys}(\vec{x}) = \sum_{k}^n \frac{\varphi_q r_k}{1 + \sum_{p} \frac{r_p}{|x - \vec{a}_p|}} \left( \frac{(\vec{a}_k - \vec{x})}{|x - \vec{a}_k|^3} \right) \equiv \sum_{k}^n E_k(\vec{x}),
\]

(2)

and the associated shape of the continuous inertial charge,

\[
\sqrt{G} \mu_{sys}(\vec{x}) \equiv \frac{1}{4\pi} \text{div} E_{sys}(\vec{x}) \equiv -\frac{1}{4\pi} \sum_{k}^n \text{div} E_k(\vec{x}) \equiv \sum_{k}^n \sqrt{G} \mu_k(\vec{x}) = \frac{1}{4\pi \varphi_q} E_{sys}(\vec{x}).
\]

(3)

In contrast to the symmetrical field of one isolated charge, the ‘elementary’ asymmetrical strength \( E_k(\vec{x}) \) depends on all vertexes \( \vec{a}_p \) (in the denominator). ‘Elementary’ subdensities \( \sqrt{G} \mu_k(x) \) of the whole charge density \( \sqrt{G} \mu_{sys}(x) \) also depend on all \( \vec{a}_p \) of material peaks. One can calculate from (3) the volumetric rest energy \( \sum_{k}^n m_k(x^o)c^2 = \text{const} \) of an isolated whole with quasi-equilibrium ‘elements’. The time-varying mass energies \( m_k(x^o)c^2 = C_k = N \omega_k(x^o)h/2\pi \) and \( m_k(x^o)c^2 = C_k + N \omega_k(x^o)h/2\pi \) are not independent formations, despite these ‘elements’ can contribute to the system integral with constant inertial contributions when \( m_k(x^o) = C_k/c^2 = \text{const} \) on the geodesic curves. Due to dissipation, there are no constant energy elements in the monistic all-unity of time-varying subcharges \( \sqrt{G} m_k(x^o) \) with inelastic exchanges inside the isolated system:

\[
\mu_k(\vec{x})c^2 \equiv \varphi_q \sqrt{G} \mu_k(\vec{x}) \equiv \frac{\left[ \sum_{k}^n E_k(\vec{x}) \right]^2}{4\pi} \equiv \left( \sum_{k}^n \frac{Gm_k^2}{|x - \vec{a}_k|} \right) + \sum_{k}^n \frac{(\vec{a}_k - \vec{x}) \sqrt{G} m_k}{|x - \vec{a}_k|} \left( \frac{\sum_{k=1}^{n-1} \sqrt{G} m_{k+1}}{|x - \vec{a}_{k+1}|} \right)
\]

(4a)

\[
\int c^2 \mu_{sys}(\vec{x}) dx^n \equiv \int \frac{d^3 x}{4\pi} \sqrt{G} \mu_{sys}(\vec{x}) = -\int \frac{d^3 x}{4\pi} \text{div} \left( \varphi_q \sum_{k}^n E_k(\vec{x}) \right) = \sum_{k}^n m_k c^2 = \text{const}
\]

(4b)
\[ \int c^2 \mu_k(x) d^3x \equiv - \int \frac{d^3x}{4\pi} \rho_q \text{div} \vec{E}_k \equiv \int \frac{d^3x}{4\pi} \vec{E}_k \cdot \vec{E}_{\text{sys}} \equiv \int \frac{\left( \frac{\hat{a}_k - \hat{x}}{\sqrt{G_{\mu
u}}} \right) \left( \sum_{j=1}^{n_\alpha} \frac{\hat{a}_k - \hat{x}}{\sqrt{G_{\mu
u}}} \right)}{4\pi \left( 1 + \sum_{j=1}^{n_\alpha} \frac{r_p}{|x - \hat{a}_p|} \right)^2} d^3x \equiv m_k c^2 \quad (4c) \]

The mass–energy density of the system in (4b) is not negative at all points of matterspace. In other words, there are no negative gravitational energies in the kinetic reality of continuously distributed energy \( c^2\mu_{\text{sys}}(\hat{x}) \geq 0 \) with the integral conservation \( \sum m_k c^2 = \text{const} \). The numerator of the ‘elementary’ density in (4a) has two sums, \( \sum \{ \ldots \}^2 \) and \( \sum \{ \ldots \left( \sum_{\alpha=1}^{n_{\alpha}} \{ \ldots \right) \ldots \} \), for monopole and bipole contributions, respectively. Such different topologies of inertial parts mean that ‘elements’ in the holistic system acquire new property compared to their isolated states, and the system is always more complex than the digital sum of isolated objects. The ‘elementary’ mass–energy in (4c) takes into account both the monopole and bipole (or interference) contributions from time-varying positions of all superimposed ‘elements’. The integral energy (4b) is always constant for the closed (holonomic) system regardless of the spacetime coordinates of elementary vertices \( \hat{a}_k \). Consequently, elastic stresses in the nonlocal whole are instant and independent from the world coordinate \( \hat{x} \). Inelastic exchanges by quantized mechanical waves (metric excitations of continuous inertia) are independent of spatial distances. These waves require common resonance properties of superimposed receivers and transmitters in a shared (non-local) matterspace.

4. Local Self-Accelerations of Correlated Densities in Their Nonlocal All-Unity

The monopole organization of static fields \( \vec{E}_1 = -\frac{1}{\hat{r}} \sqrt{G} m/r(r + r_1), \) when \( g_{\alpha\beta} = \hat{r}^2/(r + r_1)^2, \) \( r_1 \equiv \sqrt{G} m_1/c^2 \), gains the spherical symmetry for very dense and very rare regions of radial mass–energy \( c^2\mu_1 = m_1 c^2 r_1/(4\pi r^2/(r + r_1)^2) \). Continuous densities of constant charges of inertia tend to maintain their equilibrium shapes in adaptive responses to external influences. Thus, energy-information self-governance is inherent not only to vital matter but also to the metric self-organization of holonomic spacetime.

Prior to discussing nonlocal organizations with multipole densities, we look at the two-peak distribution of the system mass–energy \( (m_1 + m_2)c^2 = Mc^2 \). For simplicity, both ‘elementary’ parts, \( m_1 c^2 = \int d^3x (E_1^2 + \vec{E}_1 \cdot \vec{E}_2)/4\pi = q_1^2 r_1 \) and \( m_2 c^2 = \int d^3x (E_2^2 + \vec{E}_2 \cdot \vec{E}_1)/4\pi = q_2^2 r_2 \), can be considered at the static moment when \( \hat{a}_1 = 0 \) and \( \hat{a}_2 = (Rx, 0, 0). \) Local densities of the nonlocal charge \( \sqrt{G} \) are self-governed by their own Lorentz force density. In statics, a submicroscopic volume \( \Omega_1 = 4\pi d^3/3, r_1 \leq d \leq R \) of the densest regions at the origin undergoes the locally exerted self-force along the \( x \)-axis:

\[ F_1(0,0,0) = \int \mu_{\text{sys}} \sqrt{G} E_{\text{sys}} d\Omega_1 = \int \frac{d^3x}{4\pi \rho_q} \left( \frac{E_1^2 + 2 \vec{E}_1 \cdot \vec{E}_2 + E_2^2}{E_1^2 + E_2^2} \right) (E_1^2 + E_2^2) \approx \]

\[ \int \frac{d^3x}{4\pi \rho_q} \left[ \frac{q_2^2 r_2}{R^2} \left( \frac{1}{6} + \frac{1}{3} \right) \right] = \frac{\sqrt{G} m_2}{R^2} \]

The volume integration of peak densities around \( \hat{a}_2 \) results in the opposite self-force \( F_2(R,0,0) = -\sqrt{G} m_2/R^2 \) in the correlated distribution of nonlocal mass–energy \( Mc^2 \).

Now, by placing the origin at one selected vertex of the multipole distribution, \( \hat{a}_1 = 0 \) and \( r_1 \leq d \leq \hat{a}_2 - \hat{a}_{s,1} = \hat{a}_{s,1} \), one can calculate the Lomonosov–Lorentz self-pushing \( \int \sqrt{G} \mu_{\text{sys}}(\hat{x}) E_{\text{sys}}(\hat{x}) d\Omega_1 \) of the dense volume \( \Omega_1 = 4\pi d^3/3 \) around \( \hat{a}_1 \):
\[
F_1 = \int d\Omega_1 \left( \sum_{i} \frac{G m_i^2}{|x-a_i|^4} + \sum_{x} \frac{x_e}{|x-a_e|^3} + \sum_{n=1}^{\infty} \left( \frac{a_{n-1}}{|x-a_{n-1}|^3} \right) \right) \sum_{i} \frac{a_i}{|x-a_i|^3} \sum_{i \neq j} \frac{G m_i \gamma a_i}{a_j^2} \\
≡ \int d^3 \Omega_1 \left( E_1 \sum_{i} F_1^i + 2E_1 \sum_{i \neq j} E_s \right) = \int \frac{d^3 \Omega_1}{4\pi \xi^7} \left( 1 + \sum_{i \neq j} \frac{a_i}{|x-a_i|^3} \right) \frac{3r_1 \xi x a \beta}{|x|^3} + a_i^2 + 2 \xi x a \beta = \sum_{i \neq j} \frac{G m_i \gamma \beta}{a_j^2} \\
\]

At first glance, we simply derive in (6) the well-known Newtonian pulls between distant masses. However, our integration over the localized volume around the origin represents exclusively local self-pushes of asymmetric inertial densities to all other vertexes in the nonlocal organization of metric matterspace + time. There are no negative energies in the ethereal medium with instantaneous correlations between the monistic (kinetic) densities of eddy matterspace [5] and there are no distant gravitational pulls in such a nonlocal organization. Instead, there are adaptive self-accelerations of asymmetric densities toward dense regions in a nonequilibrium distribution of the nonlocal whole.

Instantaneous elastic self-forces/self-accelerations (6) depend on the inverse squares of distances, which is a consequence of Shannon’s information law (1). Inelastic exchanges through retarded waves do not depend on the distances between dense peaks. Wave mass-energy transfer between two independent metric organizations with separate energy balances is an external dissipation process for both systems. The measurements usually track the time delay for wave exchanges between systems with separated energy balances. Radially converging (retarded echo, formally advanced) and diverging (retarded) longitude waves in an inhomogeneous ethereal continuum are equal when describing periodic autopulsations of a holonomic energy system. Converging radial waves can be precursors of future concentrations of energy, including natural disasters and earthquakes.

5. Concluding Remarks

Based on the minute particles streaming through space, Nicolas Fatio de Duillier from the Republic of Geneva first criticized Newtonian pulls for observed attractions using local kinetic pushes in the 1690 letter to Huygens. Since 1748, this collision-based approach has become known as the kinetic gravitation of Georges-Louis Le Sage, another mathematician from Geneva. However, mechanical collisions with invisible particles should warm and slow down celestial bodies, which contradicts the available observations. Nonetheless, in 1873, Lord Kelvin tried to improve the Le Sage kinetic theory, appreciated also by Maxwell as “... seems to be a path leading toward an explanation of the law of gravitation, which, if it can be shown to be in other respects consistent with facts, may turn out to be a royal road into the very arcana of science”.

In 1742, Lomonosov was the first to propose describing the mutual attraction of visible bodies by the local pressure of an invisible liquid [1,2], which later Umov [3] described as a mobile ether with the path-varying kinetic energy \( \text{kmc}^2 \equiv m c^2 / \gamma \equiv m c^2 \sqrt{1 - \beta^2} \). Leib-
niz’s “living forces” \( \mathbf{mv}^2 \) or relativistic kinetic energy of Hamilton \( \mathbf{v} \rightarrow \mathbf{p} = \mathbf{mv}^2 \gamma \) align the transport of Umov’s ethereal energy with Einstein’s physics and Lorentz transformations because \( \kappa \mathbf{mc}^2 + \mathbf{mv}^2 \approx \frac{\mathbf{mc}^2}{\sqrt{1 - \beta^2}} \). The local self-force (6) derived from the modern information law (1) can quantitatively describe the old Lomonosov push of ethereal liquid, supplemented by inertial heat in the Umov energy transfer.

The emerging phenomena of Newton’s gravity or Nietzsche’s “eternal return of the same” are not connected with some conceptual forces but with nonequilibrium self-organization and autopulsation in a nonlocal whole. Material volumes with symmetrical densities would have no “gravitational” accelerations at all. Therefore, the local control of the mass–energy asymmetry “here” by subtle resonant intervention in the ethereal and thermal kinetics of the probe body can give a novel understanding of telekinesis, noncontact Russian combat of Kadokhinikov, and the levitation of Indian yogis.

New experimental schemes can be proposed for studying the matterspace continuum with metric waves as well as with instantaneous correlations of elastic self-stresses within the kinetic all-unity. The telescopic probes of Nikolai Kozyrev [9] with reported retarded, instantaneous, and even “advanced” (returning echo) stellar flares should be repeated on modern equipment in mechanical and electromagnetic domains. The mid-term forecast of solar activity [10] in the Baikal deep-sea experiment can also suggest new nonlocal experiments in the monistic cosmos of Tsiolkovsky, including the kinetic monism of living matter and the noosphere of material thoughts.

The monistic all-unity of ethereal and thermal densities in Russian Cosmism implies the unprecedented rejection of the Standard Model of the source particle and its retarded field to decipher the repetitive behavior of bacteria, plants, and animals before energy catastrophes and earthquakes. It is also expedient to develop human remote vision, guided by the metric-kinetic organization of local accelerations in nonlocal distributions with elastic correlations and dissipative reshaping. There are many practical implications of the ‘obsolete’ stresses of the mobile ether in an underestimated monistic universe of purely kinetic energies. In conclusion, the monistic matterspace with Euclidean 3-geometry, adaptive metric time, and nonlocal inertia can be useful for advanced studies of inert and living systems in the multilevel hierarchy of one kinetic whole.

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