Abstract—we consider the further development of the post-Shannon information approach, which was proposed by the author. By the example of the video-information of general form, which is a system of geometrical and physical components and generatrixes a complex internal structure video-information is shown. Physical generatrixes of the weak video-information can be considered as a structureless dimensional physical magnitude and used for the quantitative measurement of video-information in the corresponding material system. This generatrix of video-information can be considered as an informational quantum (from the Latin term "quantitas"). A notion of informational quantum (from the Latin term "qualitas") for semi structured fully geometricized generatrix of video-information is introduced. One can consider informational quantum as weak (a rough) or strong (a thin) measuring structure, which is intended for the qualitative representation (measurement) of the structure of the same material system. It is shown that in the weak-field approximation fully geometricized structural component of a weak video-information carries out activation of the physical components of a weak video-information. The use of elements of the theory of differential form is shown that the physical and structural components of a weak video-information (which evaluation is an image) are naturally discretized. For discretization of the video-information structures hierarchy as a set of locals quanta (1-forms) and globals 1-, 2-, 3-quanta (of lines, of surfaces, of geometrical bodies) may be used.

Index Terms—video-information, the internal structure, the quantum, the qualtum, the differential form, the local qualtum, the global qualtum.

I. INTRODUCTION

The formation and transmission of video-information in space-time can be described according to the results of [1], [2] as follows:

- **Video-information** - is a measure of interaction-measurement of physical and structural components of material system. Such a system, in accordance with the strong conservation law has the only conserved tensor of the second rank (energy-momentum tensor), which is a natural source of video-information field (primary or secondary) in the Minkowski space coordinates, and can be identified with the video-information;
- **Transfer of video-information** may be carried out with primary or secondary video-information field of any physical nature.

As part of the field approach to simplify the mathematical calculations it is believed that the Lagrangian density of a corresponding material system does not contain derivatives higher than the first order [1], [2]. This limitation leads to the fact that video information field equations are equations of second order. Nevertheless, such a simplified reality description permits to explain the nature of the video-information ability of the real world objects. In line with the principle of video-information the structural component of video-information may be excluded from consideration in the curvilinear coordinates of the effective Riemannian space-time [1]. Figuratively speaking, her energy goes to form this space. The covariant equation of conservation of the physical components of the video-information \( T_{(E)} \) in the effective Riemannian space-time can be written as [1]

\[
\nabla_m T_{(E)}^{nm} = \partial_m T_{(E)}^{nm} - \Gamma^{nm}_{m} T_{(E)}^{n} + \Gamma^{nm}_{m} T_{(E)}^{n} = 0. \tag{1}
\]

Here \( \nabla_m \) — the operator of covariant differentiation in the effective Riemannian space-time, and \( \Gamma^{nm}_{m} \) — connection in the effective Riemannian space-time, which is known to be expressed through the metric tensor \( g_{mn} \)

\[
\Gamma^{nm}_{m} = \frac{1}{2} g^{nn} \left( \partial_m g_{mq} + \partial_q g_{mq} - \partial_q g_{mn} \right),
\]

taking the following form [3]

\[
\Gamma^{nm}_{m} = G^{nm}_{m} + \gamma^{nm}_{m}.
\]

Here the connection in a flat space-time \( \gamma^{nm}_{m} \) is defined by the metric tensor of Minkowski space \( g_{mn} \) as

\[
\gamma^{nm}_{m} = \frac{1}{2} g^{nn} \left( \partial_m g_{mq} + \partial_q g_{mq} - \partial_q g_{mn} \right),
\]

and third-rank tensor \( G^{nm}_{m} \) relatively general coordinate transformations be of the form [1]

\[
G^{nm}_{m} = (1/2) g^{nn} \left( D_m g_{qn} + D_q g_{qn} - D_q g_{mn} \right),
\]

where \( D_m \) — the covariant derivative in the Minkowski space.

II. VIDEO-INFORMATION OF A GENERAL FORM

In the effective Riemannian space-time, active and activated the video-information is presented by its physical components alone. Structural components of video-information are involved in the formation of the video-information field indirectly, i.e. through the structural properties of the effective Riemannian space. Let us consider in the metric analysis of the structure of the binary video-information in Minkowski space, which is the source of the secondary video-information field. In accordance with the conservation laws binary video-information can be
represented as

\[ T^m_{\alpha\beta\gamma\delta} = T^m_{\alpha\beta\gamma\delta} + T^m_{\alpha\beta\gamma\delta} \]

in global coordinates of Minkowski space

\[ T^m_{\alpha\beta\gamma\delta} = T^m_{\alpha\beta\gamma\delta} + T^m_{\alpha\beta\gamma\delta} \]

in the local coordinates of the effective Riemannian space

Here is only partially geometrized structural component video-information, expressed through its own generatrices, of the form

\[ t^m_{S,E} = t^m_{S,E} + t^m_{S,E} \]

The physical component of the video-information, which is also partially physicalized, is constructed similarly

\[ t^m_{S,E} = t^m_{S,E} + t^m_{S,E} \]

The availability of a pair of partially dual components in binary video-information, each of which incorporates a pair of dual generatrices can serve as a basis to hypothesize the natural fractality of binary video-information [1]. A complicated fractal structure of video-information hinders an investigation of the features of its internal structure. It is clear that the construction of fractal video-information does not exhaust all the questions on the structure of the video-information and a more detailed analysis is required. The following constructions are focused on the analysis of the structure of the binary video-information, as the most relevant for technical vision. Expression (2) can be expanded to show the relationship between the binary representations of the video-information in the Minkowski space coordinates and the effective Riemannian space-time, namely:

\[ t^m_{S,E} = t^m_{S,E} + t^m_{S,E} \]

where \( T^m_{S,E} \) — the physical component is activated video-information in the curvilinear coordinates of the effective Riemannian space. The left-hand side of expression (5) corresponds to the fractal structure of the binary video-information at each point of Minkowski space

\[ t^m_{S,E} = t^m_{S,E} + t^m_{S,E} \]

where \( t^m_{S,E} \) — partially geometrized value of structural component of a binary video-information of general form; \( t^m_{S,E} \) — partially physicalized value of the physical component of a binary video-information of general form.

The theory of video-information of general form because of the tensor nature of its equations allows finding some parallels with quantum mechanics describing the fundamental properties of the microcosm. But «quantum mechanics is untrue when applied to macroscopic bodies» [R. Penrose] [4]. Thus, with respect to the video-information quantum mechanics can be regarded as suggestive theory only. Separation video-information into two components in the Minkowski space coordinates suggests the need for a joint consideration of these functionally different terms of video-information, the nature of which is only partially comparable. It is quite possible that an internal functional asymmetry of video-information related to its separation into structural and physical components determines the functional asymmetry of the human brain, which is, above all, a unique system of intellectual evaluation of information in general, and video-information in particular. It is known that the brain as an intelligent information system is characterized by functional specialization of the left and right hemispheres of the brain [5]. The left brain is responsible for the abstract-logical component of thinking, which is mainly qualitative. The right brain provides specifically-figurative and thereby mainly a qualitative perception of reality. As a result, the functionality of the left and right brain hemispheres upon the evaluation of video-information or any other information from the outside world entering the brain by sensory channels being no inter changeable, complement each other. It is hardly worth to copy completely the structure of the brain as a carrier of intelligence upon the technical implementation of intelligent systems. You must take into account the difference of technical and biological element bases and significant impact of the evolution on the development process of natural intelligence. Apparently, it makes sense to use biological ideas as a guide for building a constructive, focused and fully comprehended information theory of intelligence, which should be invariant to the nature of intelligence. A totality of strong (S, E) and weak (s, e) physical and geometrical parameters of the component of video-information can be used to show the structural features of video-information of general form in the Minkowski space coordinates. Only in this flat space-time physical (E, s) and structural (S, e) the components of the video-information can be considered together, because each of these components is partially physicalized and partially geometrized, respectively. To describe the video-information structures we use the following strong and weak structural parameters: S — corresponds by the strong (fine) fully geometrized structure; s — corresponds to the weak (coarse) fully geometrized structure. To describe the physical relationship of video-information we use the strong and weak of physical parameters, which we denote as follows: E — corresponds by the strong (large) physical quantity; e — corresponds to the weak (small) physical quantity. In the effective Riemannian space-time we have

\[ S \equiv s \quad \text{and} \quad E \equiv e \]

for video-information of general form. These conditions correspond to the dominance of the structural generatrix of the structural component of the video-information over the structural generatrix of the physical component of the video-information as well as the dominance of the physical generatrix of the physical component of the video-information over the physical generatrix the structural component of the video-information. As a result strong interactions (interaction-measurements) between physical and geometrical generatrices of the components of video-information arise. This ensures a stable existence of the video-information as a geometrical-physical system formed by two strongly interacting components of the video-information (partially geometrized and partially physicalized).
Using the rule of addition of tensors components and generatrixes of video-information (of unary or binary), $t^n = t^n_\text{m} + t^n_\text{s}$, $t^n_\text{m} = t^n_{\text{E}|\text{m}} + t^n_{\text{EE}|\text{m}} + t^n_{\text{EE}|\text{E}}$, in which have the possibility of rearrangement of terms we expand the expression for the video-information in the form of

$$
t^n_\text{m} (S,E) = t^n_\text{m} (S,e) + t^n_\text{m} (0,E) + t^n_\text{m} (0,0)
$$

Geometrized generatrix of video-information. Then, semi-structured and fully geometrized generatrix $t^n_{\text{SS}|\text{m}} (s,0)$ can be considered as a dimensional structure of the fully geometrized generatrix $t^n_{\text{SS}|\text{m}} (0,0)$ of video-information. Therefore, the structure «S» of video-information may be submitted to decomposition (bundle) into the set of dimensional structures «s», which is formally reduced to their disjoint union. Using the similar line of reasoning, we arrive at the fact that the virtual structureless physical component of video-information can be formed by partition of a physical quantity with strong parameter «E» into a set of dimensional unstructured physical quantities with weak parameters «e», which also may be represented by disjoint union. Thus semi-structured fully geometrized generatrix $t^n_{\text{EE}|\text{S}} (0,s)$ is a carrier of weak dimensional structure «s», which is used for qualitative “measurements” of video-information structures of the material system. In this connection, the name «qualitas» of the video-information is logically justified for this generatrix («qualitas» from the Latin term «qualitas»). In its turn, a weak structure less physical generatrix $t^n_{\text{EE}|\text{E}} (0,e)$ corresponds to physical value «e» used as a further indivisible value for the quantitative measurement of physical video-information in the same material system. Therefore, this generatrix received the name "quantum" of video-information («quantum» from the Latin term «quantitas»). Thus, video-information as the set of physical and geometrical properties of the material system cannot take the form of fractal alone, but can be expressed using the concepts of quanta and qualita video-information (Fig. 1). As shown by the author [1], of two components of video-information its structural ("activated") component, is a determining one and induces effective Riemannian space-time. The physical component of video-information alone is defined in the local coordinates of the real (effective Riemannian) space-time. This explains a dominating nature of the physical properties that fix manifestation of the matter in the real (curved) space and thus create the illusion of lack of structural properties (abstract, formal-mathematical) of the matter. Finally, we note singularity the multiplicative structure of video-information that should not be overlooked. This is another approach to understanding the structure of video-information, based on the formal properties of video-information represented by mixed tensor $t^n_\text{m} = \xi^n \eta_m$ of the second rank of the type (1, 1) in the Minkowski space global coordinates. Such a mixed tensor is the product of the vector (contravariant components of video-information) and the covector (covariant component of video-information) [6]. Most of the standard courses in geometry, tensor analysis and mathematical physics do not consider important details of the differences of the concepts of vectors and covectors [7] which are often introduced as a one concept. However, in-depth analysis of video-information should consider the distinction between vector and covector. Indeed, according to the strong conservation law video-information
presented by tensor $\tau^m_{i\kappa j\kappa} = \delta^{m}_{\kappa j\kappa}$ in the Minkowski space coordinates is a conserved (invariant) value and can be considered as a source of video-information field. Search for invariant quantities has now become an essential element of scientific analysis in the fields of science where the concept of structure is of crucial importance. An effective method of the structure perception is the conservation laws in conjunction with the fundamental physical principles. Let’s consider video-information in terms of the principle of complementarity. The essence of this principle can be defined as follows: every phenomenon of nature requires, at least two mutually exclusive, but complementary concepts for its determination.

\[
\begin{align*}
\tau^m_{(i\kappa j\kappa)}(0,S) & \quad \tau^m_{(i\kappa j\kappa)}(e,0) & \quad \tau^m_{(i\kappa j\kappa)}(0,\lambda) & \quad \tau^m_{(i\kappa j\kappa)}(E,0) \\
\tau^m_{(i\kappa j\kappa)}(e,S) & & \tau^m_{(i\kappa j\kappa)}(E,s)
\end{align*}
\]

\[
\tau^m_{(i\kappa j\kappa)}
\begin{cases}
S = \bigcup_{j=1}^{S}, E = \bigcup_{j=1}^{E}
\end{cases}
\]

Fig.1 Figurative representation of the internal structure of video-information as a cross-system of physical and geometrical properties of matter: from fractal towards the famous symbolic image.

In accordance with this principle, a mixed tensor of video-information represented as the product of a vector by a covector, conforms to vector-covector dualism. In this regard, the process of default video-information evaluation by a technical vision system assumes the use of two types of instrumentation. One of them must be capable of recording the physical representation of video-information, and the other – a structural presentation of video-information. It’s not easy to implement because measuring physical and structural processes are not only incompatible, but unachievable as well. Vector and covector representations characterize equally video-information, and therefore they do not contradict, but complement each other in the technology of technical vision that implements a process of video-information evaluation.

III. WEAK VIDEO-INFORMATION

Before we define the weak video-information fields in space-time, or at the input of a video-receiver we should attain a clear understanding of the nature of weak video-information. Indeed, there is a match between video-information of general form in the coordinates of the effective Riemannian space-time, and weak video-information, which is best represented in the Cartesian (rectangular) coordinates of the Minkowski space. However, due to non-linear systems of equations for video-information of general form, this correspondence does not reduce to a simple similarity transformation. Nevertheless one may consider weak video-information as a source of a weak video-informational field [1]. In practice, a weak video-information field approximation corresponds to an axial (paraxial) approximation widely used in wave processes. Thus, there is a real natural limitation on the quality of the video-information transmission by means of a short-interaction, where the weak video-informational field acts as an intermediary. Indeed, in the paraxial approximation, the solution of the video-information field equations can be considered in the flat space-time and in the relatively wide range of distances consisting of two main zones: the near-field zone (Fresnel region) and of the far-field zone (Fraunhofer region) zones. In accordance with the paraxial approximation it is believed that the wave fronts of the weak video-information field in these areas may have spherical or flat shape, respectively. This circumstance determines the presence or absence of spatial selectivity of video-sensor
with respect to the third coordinate (by the depth) for estimating weak video-information in the form of the image. This image represents in the intuitive geometric shape the observed surface a controlled object. The two-dimensional Riemannian space is induced by inclusion of the observed two-dimensional surface of a controlled material object in the surrounding surface formed by three spatial coordinates of the Minkowski space rather than structural component of weak video-information. At the first stage of technical vision the desired visual characteristic of any material object is a visual representation corresponding to a conventional intuitive spatial form, which is called the image. This visual property of an object is produced by its two-dimensional surface which is observed from the video-receiver and has a certain internal geometry. As is known, the two-dimensional Riemannian space is a space of constant curvature, which is "conformally Euclidean space (at least locally)" [Rashevsky P.K.] [8], [9]. From video-information of the general form [1] follow the equations of conservation of weak video-information which, in general (regardless of primary or secondary character weak video-information) can be written at \( \nabla \rightarrow D_\alpha \) and \( D_\alpha \rightarrow \partial \alpha \) as a
\[
\partial \alpha \left( T^{(0)}_{\alpha \beta \gamma} + T^{(0)}_{\beta \gamma \alpha} \right) = \partial a \left( T^{(0)}_{\alpha \beta \gamma} + T^{(0)}_{\beta \gamma \alpha} \right) = 0 \quad (8)
\]
\[
D_\alpha T^{(0)}_{\beta \gamma} = \partial a \left( T^{(0)}_{\alpha \beta \gamma} - \gamma^\alpha \gamma^\beta T^{(1)}_{\gamma \alpha} - \gamma^\beta \gamma^\alpha T^{(1)}_{\gamma \alpha} \right) = \partial a \left( T^{(0)}_{\alpha \beta \gamma} - \frac{1}{2} T^{(0)}_{\beta \gamma} \gamma^\alpha \right) = 0 \quad (9)
\]
Here \( T^{(0)}_{\alpha \beta \gamma} \) – the structural component of a weak video-information in canonical form and in the coordinates of Minkowski space; \( T^{(0)}_{\beta \gamma \alpha} \) – the physical component of weak video-information in the local coordinates of the conformal Euclidean two-dimensional Riemannian space of constant curvature, \( \nabla \rightarrow D_\alpha \).

Comparing the expressions (8) and (9) obtained using the canonical approach and in compliance with the conservation laws one can derive an identity important within the meaning
\[
\gamma^\alpha \gamma^\beta T^{(1)}_{\gamma \alpha} = - \partial a T^{(0)}_{\beta \gamma} \quad (10)
\]

(Christoffel symbol) in Minkowski space, defined by the metric tensor \( \gamma^\alpha \) of Minkowski space and by the combination of its partial derivatives.

Mathematical identity (10) leads to a number of important conclusions:
- The structural component of the weak video-information – when the conservation laws are met – can be considered as a kind an "activator" of the physical component of weak video-information;
- By reason of such asymmetry in the relationship between the components of a weak video-information their one-to-one correspondence should be treated as a homomorphism.

It is known that the progress in the notation corresponds to extended understanding [7], [10]. This is achieved through the introduction of new ideas and development of clear definitions where they did not exist previously. We consider in this context the use of the elements of the theory of differential forms in the analysis of the structural components of weak video-information. The key here is that the differential forms have a natural algebraic structure, which is now known as the exterior algebra. A result of the divergence of the structural component video-information in the right side of the identity (10) is covector (differential 1-form). Unlike mathematical analysis "infinitely small" are used exterior algebra doesn’t consider differentiation symbol \( d(x) \) as a structure less infinitesimal quantity which acquires a slightly different interpretation therewith, for example, of the element density (1-form) [7]. This form can be integrated along the curve (or line circuit.) Moreover, we can also consider the 1-form defined by the corresponding curve in a space of higher dimension, namely, the one-dimensional space of the [7]. Thus, a 1-form being a non-zero covector and generally possesses the necessary properties of the elementary dimensional structure. Because of this it is quite justified continue to use a term that has an informative sense, namely, a local qualtum, instead of the term 1-form. The local qualtum has a deep sense – it is a connection form. According to the left-hand side of (10) local qualtum can be considered as the convolution of the Minkowski space connection with the physical component of weak video-information presented in the local coordinates of the two-dimensional Riemannian space of constant curvature. It should be recognized that such a process of structuring, if considered it in accordance with the left-hand part of identity (10), is confusing and not clear. One may consider construction of a local qualtum resulting from the external differentiation \( \partial \alpha \) of 0-form of the structureless physical components of weak video-information as an alternative structuring technique. This increases the order of the differential form per unit and converts it into a 1-form (local qualtum). The existence of an operator \( \partial \alpha \) , called by the exterior differential or exterior derivative, is a feature of exterior algebra. The result of such an action of the operator on the differential form is a differential form per unit of a higher order. The right-hand side of the identity (10) is the divergence of acts opposite as compared to the operator of exterior differ the structural components of weak video-information that entiation and converts a 2-form structural components of weak video-information into a 1-form (local qualtum). Such a transformation is accompanied by a reduction of the order of the differential form and may be regarded as a result of the impact of the adjoint the exterior differentiation operator \( \delta \) on the 2-form structural components of weak video information and the formation of a 1-form [10]. Thus, for understanding the meaning of identity (10) one can use a following scheme (Fig. 2)
The operator of exterior differentiation \( d \{ \} \)

\[
\left( ^{(0)} \right) T_{m}^{\nu} (E) \quad \text{order in the differential form per unit}
\]

Local quantum (1-form)

The 0-form of a structureless physical component of weak video-information

\[
\left( ^{(0)} \right) \gamma_{mn}^{q} \quad \text{order in the differential form per unit}
\]

The adjoint operator of exterior differentiation \( \delta \{ \} \)

The 2-form of a fully geometrized structural component of weak video-information

**Fig. 2** The identity of the results of the ascending processing of 0-forms of the physical components of weak video-information and of the descending processing of 2-forms of structural components of weak video-information

Constant curvature of two-dimensional Riemann space can be implemented by bending a two-dimensional surface of an object in three-dimensional Cartesian coordinates. Thus, the physical properties of the structural components of weak video-information provide a curvature of space can be considered missing, and the structural component of weak video-information can be treated fully geometrized. In a weak field approximation, expression (7) can be rewritten with the same notation of strong and weak structural and physical parameters \((S,E,s,e)\) as follows

\[
\left( ^{(0)} \right) \tau^{mn} (S,E) = \left( ^{(0)} t^{mn}_{m} (S,0) \right) + \left( ^{(0)} t^{mn}_{m} (s,0) \right)
\]


\[
= \left( ^{(0)} t^{mn}_{m} (S,0) \right) + \left( ^{(0)} t^{mn}_{m} (s,0) \right) + \left( ^{(0)} t^{mn}_{m} (s,0) \right) + \left( ^{(0)} t^{mn}_{m} (0,E) \right)
\]

\[
= \left( ^{(0)} t^{mn}_{m} (S,0) \right) + \left( ^{(0)} t^{mn}_{m} (s,0) \right) + \left( ^{(0)} t^{mn}_{m} (0,E) \right)
\]

\[
= \left( ^{(0)} t^{mn}_{m} (S,0) \right) + \left( ^{(0)} t^{mn}_{m} (s,0) \right) + \left( ^{(0)} t^{mn}_{m} (0,E) \right)
\]


\[
= \left( ^{(0)} t^{mn}_{m} (S,0) \right) + \left( ^{(0)} t^{mn}_{m} (s,0) \right) + \left( ^{(0)} t^{mn}_{m} (0,E) \right)
\]

From these expressions, it follows that weak video-information can be presented in the form of a fully geometrized component considered in conjunction with a fully physicalized component of the same weak video-information. In this case, the structural component of weak video-information is partitioned into fully geometrized semistructured dimensional structures (qualta of information), and the physical component of weak video-information, in its turn, is partitioned into unstructured dimensional quantities (quanta of information).

One should note the fundamental difference between the information quanta and qualtas of the macrocosm and physical quanta and physical structures of the microcosm. It is well known, for example, that of the quants energy \( E = hf = \hbar \omega \) is a multiple of Planck’s constant \( \hbar = h/2\pi = 1,05459 \cdot 10^{-7} \text{ erg \cdot sec} \), which has the dimension of the classical action [7], [11]. Other quantum values that rest on Planck’s constant are also extremely small. Therefore discretization in the microcosm and the macrocosm are processes not comparable in scale of values that have a fundamentally different nature.

Comparing expressions (7) and (11) we can conclude that the processes of a discretization of video-information of general form and of weak video-information are analogous, but implemented in a different spatial dimension. This results
in that a process of the discretization may be of directly visual (for weak video-information) and abstract nature (for video-information of general form). Generally speaking, singularity of video-discretization is explained by the fact that the process of video-information of general form evaluation is of multistage nature, which is the aim of technical vision [12]. For weak video-information, quantum possesses the topological structure which can be mapped as the geometric point, and thereby represents the structureless physical portion of information. This eliminates the use of the quantum as a measuring video-structure, which should be at least one-dimensional. With weak video-information, qualum is fully geometrized and is considered as some portion of dimensional structural information that may be undivided (the local quatum) or divided (global 1st and 2nd qualta corresponding to the lines, contours or surfaces). The existing and widely used at present sampling theorem of Kotelnikov – Shannon does not involve sampling of messages accounting their information structures. This is true as long as the final receiver of information, an appraising its meaning, is a natural human intellect. The possibilities of human intelligence are immense, though unclear in many respects. It is this allows a person to make far-reaching conclusions about the data content based on a limited sample of unstructured physical data. The situation is much more complicated when artificial intelligence of the technical vision system becomes a final receiver of video-information. It is impossible now to limit oneself by one sampling of the physical component of weak video-information at a low hierarchy level of intellectual visual system only. To determine the meaning of communication one should perform sampling and evaluation of the structural component of video-information at all hierarchical levels of the system. Generally speaking a necessity to construct an adequate assessment of the structural components of video-information has brought forth intelligence as an essential attribute of high-performance video-systems (artificial and natural).

IV. CONCLUSION

The structure of video-information is covered using the rules of tensorial addition and the theory of the differential forms. One has pointed out a structural and a functional asymmetry of the structural and physical components of video-information, which can cause a known functional asymmetry of the right and left hemispheres of the human brain – the most effective system for evaluating information to date. The notion of a quantum as a local qualitative characteristic of video-information and a quantum as of local quantitative characteristic of video-information are introduced. Quantum can be interpreted as 0-quantum to avoid confusion with the notions of quantum mechanics. At present numerous problems in different areas of modern society (in the social structure, in science, engineering and economics) are caused by unaccounted structural (qualitative) properties of the real world. This slows down the progress. In this regard, one becomes aware necessity for development of a classical physical picture of the material world into a more flexible and harmonious information picture where the physical (quantitative, force) and structural (qualitative: geometric, logical, nonforce) properties of matter are considered together.

V. ACKNOWLEDGMENT

The author is grateful to the Institute of Petroleum Geology and Geophysics of the Siberian Branch of the Russian Academy of Sciences for supporting this work and to V.M. Gruznov (Deputy Director for Research) for a discussion of the results.

REFERENCES


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