SKETCHES OF THE THEORY OF REALITY

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Abstract: This preprint discusses the concept of interpreting matter as a mathematical system.

The theory of reality refers to the physical interpretation of matter. This article discusses the interpretation of matter as a mathematical system, a similar study on the topic [1].

1. The idea of a unitary system.

Let the set of forms of matter and the forms of their interaction represent a system consisting of a set of elements (e), their interaction is determined by conditions (c), variations of elements and conditions are determined by parameters (p). If the condition is not determined by another condition (consequence), then this is an axiom.

The features of the elements, conditions and parameters make up the architecture of the system.

A unitary system is when there are no other systems.

2. Cosmological unitary systems.

The Universe is considered as a unitary system.

2.1 A system in which there are no elements, conditions and parameters (c = 0, e = 0, p = 0), that is, identical to 0, is a «zero system». The unitary zero system corresponds to the missing world – M0. The zero system is an integral alternative to any system.

According to the principle of causality, the null system is unchangeable, that is, the emergence of another system is impossible. The assumption of the possibility of M0 and the actual existence of the world is possible in the case of the identity of M and M0, respectively, the expression (1) is valid.

$$\sum(\boldsymbol{e},\boldsymbol{c},\boldsymbol{p}) + \sum(-\boldsymbol{e},-\boldsymbol{c},-\boldsymbol{p}) = \boldsymbol{M}(\mathbf{0}) \quad \textit{(1)}$$

2.2 Let a system in which the elements and conditions are mathematical (Pythagorean world, Mp) be a mathematical system, then the set of states of such a system is equivalent to the set of solutions, that is, this architecture has a corresponding continuum of different states (architectures) that are combinations and variations of parameters, conditions and elements.

2.3 It should be assumed that a non-mathematical system is impossible. The exclusion of such a key axiom of mathematics as equality $n = n$ leads to $n \neq n, n = 0$, therefore, any element is not preserved, as well as the system consisting of it is not preserved (of course, unless this system is determined by an extraneous source, then it will be incoherent).

3. Elements and conditions.

Consider three elements A,B,C connected by the conditions a,b. Element B and conditions a,b can be hidden by a black box, resulting in two elements and one condition ab (2). The function of the relationship of elements A,C is preserved, the information capacity of the system is reduced, a similar operation is possible with conditions. Accordingly, the validity of the elements and conditions of any region of the system is determined by the magnitude of the local entropy of this region.

$$[\boldsymbol{A - a - B - b - C}] \equiv [\boldsymbol{A - ab - C}] \quad \textit{(2)}$$

4.1 **Reference.**

The connection of parts of structures can be characterized by the value of the reference μ – this is an index that characterizes the correspondence of the area (element, set of elements, conditions) a_g maximally similar to the area b_g belonging to this set B. The reference is commensurate with the value of the correlation between the two regions of the system, and is equal to 1.0 if they are identical, that is, for the elements of this set μ = 1. The index is determined by the expression (3).

In the aspect of this article, reference characterizes the conditions and elements of this unitary system.

$$\mu = \frac{a_g}{b_{g(B)}} \qquad (3)$$

The area of the system with a reference of μ=1 in relation to the observer is perceived by him as reality. Quantum entanglement is probably an example of the phenomena of boundary referency achievable by measurement.

4.2 Let a function be a state (of a given mathematical structure) for a set of points, a point is an element, a coordinate system is parameters. In the absence of points, we have a continuum of an infinite number of states. One point forms the final state region, respectively, two or more points form the state region, which is the intersection of the state regions of each point, if one exists.

Also, if all points belong to one function, then their reference is 1, if the reference of any points is 0, then there is not a single function between these points. It is equally possible to assume that the function is the original and is the carrier of points, as well as that of the entire continuum, the set of points is the original and have a reference value equal to 1 for the image

5. The anthropic principle, multi-world interpretation.

The observed world is a field in a continuum of states corresponding to the anthropic principle.

The set of states in the continuum united by the property of alternativeness can be regarded as a justification for a multi-world interpretation.

6. Properties and predictions.

- Absolute determinism.

- Absolute symmetry. It implies such a state of a continuum, the superposition of all conditions and elements of which is identical to M0. Including negative energy, possibly existing in the negative world as a general solution.

- The law of conservation. Given entropy, this principle applies only to states.

- Collapse in perspective. If a unitary mathematical system is a hierarchy of algorithms, then it is possible to detect the collapse of the number and complexity of conditions in the future.

6.1 Spontaneous topological curvature.

The alleged phenomenon is connected with the material component of the mathematical structure. The material component cannot cease to exist, therefore any mathematical structure is discrete, accordingly, a quantity having a material component cannot be transcendental.

The non-transcendence of the constant π manifests itself in the formation of spontaneous topological curvature in the topological properties of the structure. Nonzero topological curvature will manifest in a four-dimensional space on a scale commensurate with its discreteness. It can be positive and negative. With the discreteness of the space commensurate with the Planck length, non-zero curvature will manifest itself in the form of fluctuations of curvature with a random distribution.

The fluctuation of the curvature of space can be detected by photon scattering, the severity of which, in particular, depends on the distance to the source. The random distribution of fluctuations leads to the probability of soliton formation – a local change in curvature (without mass). With the discreteness of the space of cosmological scales, additional nonlocal positive or negative curvature will be observed. Also, non-zero curvature will manifest itself in the properties of elementary particles having a topological origin or component, respectively, a fluctuation of such properties (mass, possibly electric charge) will be observed identical particles have equal energies.

References

(1) Tegmark, Max. Our Mathematical Universe (2014)