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SOME CONSEQUENCES FROM VEITSMAN'S THEOREM ON SPACES ANG FORCES FORMING THEM

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Abstract

Some consequences follow from Veitsman's theorem. It is supposed that the physical time in space dependences on the state of the system under study. If space is in equilibrium, then there is no time known to us from physics in it. If the space is anisotropic then the time is to be a vector.

Keywords: Consequences; Veitsman's Theorem; Forming.

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1. Introduction

Veitsman's theorem on spaces and forces says: "Long-raged interaction forces of the dimensions **i** =0,1, 2,…,**n** can form real isotropic Euclidean spaces if and only if the dimensions **j** of these spaces equal **j**=**i**+1".

This theorem was proved with help of the following expressions:

$$div_n\mathbf{A}_{(n)}=Lim\frac{\oint_n a_\rho n_\rho d\Lambda_{(n-1)}}{\Omega_{(n)}};\Omega_{(n)}=C_{(n)}\rho^n.\quad \Lambda_{(n-1)}=nC_{(n)}\rho^{n-1},\ \ C_{(n)}=\frac{\pi^{n/2}}{\Gamma\left(\frac{n}{2}+1\right)}\ , \qquad (1)$$

$$\Omega_{(n)}\to 0$$

$$\mathbf{F}_{(n)}=-km_1m_2\mathbf{R}_{(n)}/R^n_{(n)}\ ;\ \ \mathbf{A}_{(n)}=\mathbf{E}_{(n)}=(\mathbf{F}_{(n)}/m_2)=-\mathbf{R}_{(n)}\frac{km_1}{R^n_{(n)}}; \qquad (2)$$

where index "n" in (1 – 2) indicates that these formulae refer to **n**D-space (**n =** 1,2,3…m); $d\Lambda_{(n-1)}$ is the element of **nD**-surface; n_ρ the component of unit vector perpendicular to each point of this **(n – 1)D**-surface; $\Omega_{(n)}$ the **nD**-volume; $\mathbf{F}_{(n)}$ the interaction force between of masses *m* 1 and 2 in

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nD-space; k the constant of gravitation in **nD**-space ($kg^{-1} \cdot m^{n} \cdot s^{-2}$); **E** the vector of gravitation field intensity ($m \cdot s^{-2}$), as $m_2 = 1$; $\Gamma\left(\frac{n}{2}+1\right)$ the gamma function.

It was shown, if the theorem will not be respected then the space of each dimension (**n**=1,2,3,…) cannot be formed.

As known, our space-time is expanding, and it is isotropic regarding gravitational interaction and physical time. But what is physical time?

We can touch to the linear sizes or, in any case, look at them, e.g., at the etalon of meter done from Iridium and Platinum. Real substance is in the base of the linear sizes. But can we touch the physical time or look at it? No, of course. Such time is something imaginary. We can only state that the physical time is a criterion that characterizes a flow of physical processes. This criterion is closely bound with the energy spent in the process. However, there are many physical processes in the Universe but the physical time is only one according to our observations. This quantity is a scalar. Then is there a fundamental process in our Universe which defines the physical time known from physics? We consider that it is the process of its (the universe) expanding. This process is stationary (i.e., $\frac{\delta \mathrm{E}}{\delta V} = const$) and it is central-symmetric in the space because our universe is isotropic; here E is the energy of the expansion of the universe. Namely the constancy of its (of the energy) specific density gives us the constancy of the physical time. But what can we identify this energy with? We have to identify this energy with the energy of vacuum. Here the vacuum is a starting point.

Of course, there are many processes in the Universe, but their total energy is much less that the vacuum energy. Therefore, these processes cannot, as a rule, effect on the main time of the Universe. If $\frac{\delta \mathrm{E}}{\delta V} = 0$, then the Universe is in equilibrium and there is not any main time. As a consequence, there is a time in each subspace depending on processes flowing in this part of the space.

The main conclusion. We are living in the Universe which is isotropic and expands stationary. We can live only in such space-time.

References

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