

CASUAL MANIFESTATIONS OF TIME AND THEIR COSMOLOGICAL EFFECTS

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In the paper [1] the two laws of time were formulated. Now we can give the mathematical proof of these laws. The number characteristic τ of time (for example, epoch, date) in space-time with coordinates (t, x, y, z) is considered as random variable with distribution $f_\tau(t)$. In [2] was found exact formula for one of laws of time. More general formula has the form

$$\Delta D \sqrt{(\Delta\tau)^2 + (\mathbf{M}\tau)^2} \geq c_0, \quad (1)$$

where

$$D(t) = -c_0 \frac{d}{dt} \ln f_\tau(t), \quad c_0 = k_0 (\mathbf{M}\tau)^2,$$

is the velocity of disorganization of historical event, ΔD , $\Delta\tau$ are the mean square derivations and k_0 is some constant. It follows from (1):

1) if $|\mathbf{M}\tau| \ll \Delta\tau$, then $k_0 (\mathbf{M}\tau)^2 \leq \Delta D \Delta\tau$ (*the law of the uncertainty of description*). The less time of life of investigated historical event the more contradictory details. Moreover, the more antique epoch $t_0 = \mathbf{M}\tau$ the less chance to ascertain the truth;

2) if $\Delta\tau \ll |\mathbf{M}\tau|$, then $k_0 |\mathbf{M}\tau| \leq \Delta D$ (*the law "time creates facts and documents"*). The number of contradictory details about past (or future) grows to ∞ when epoch of event $t_0 \rightarrow \pm\infty$;

It is evidently [1], that one must exist the third law of time, because ΔD can not be unbounded, i.e. $\Delta D \leq c_1 |\mathbf{M}\tau|$.

For normal distribution $f_\tau(t)$ we have

$$\Delta D \leq |\mathbf{M}\tau| [1 + (\mathbf{M}\tau)^2 / \mathbf{M}\tau^2 + o((\mathbf{M}\tau)^2 / \mathbf{M}\tau^2)]^{1/2}. \quad (2)$$

We can declare, that the Past and Future are chaotic, but one is possible to register cosmological events of Past or Future with some probability as events of Present. Random character of time makes random the properties of the Universe [3].

References

1. A.K. Guts, *Restoration of the Past and three Principle of Time*. - Los Alamos E-print paper: physics/9705014 (1997).
2. A.K. Guts, *Relation of uncertainty for time*. - Los Alamos E-print paper: physics/0101065 (2001).
3. A.K. Guts, *Spacetime & Substance*, **1**, 163 (2000).