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On the time discrete course

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In blessed memory of the remarkable investigator of Time Prof. A. Levich

Talk of A.N. Morosov

In April of 2016 the Professor of Bauman Moscow State Technical University A.N. Morozov delivered the interesting and deep talk at the Russian Temporology Seminar [1, 2]. He presented "Theoretical and Experimental Research of Physical Time Fluctuations" describing "a model of physical time based on the assumption that time is a Poisson random process with an intensity that depends on irreversible processes occurring in nature." This result was revealed in the series of experiments with voltage fluctuations in small volumes of electrolyte in two independent electrolytic cells. The experiments were carried out over four years from 2011 to 2015. As the main hypothesis explaining the experimentally observed effects, a model of change in the intensity of fluctuations of physical time under the influence of entropy in irreversible natural processes occurring in the Sun and Earth thermal radiation was proposed.

So, the model presumes that observable physical time presents a Poisson random process $\tau(t)$ with jumps $\tau_0 = 1/\nu_\tau$, where ν_τ is a process intensity (Fig. 1).

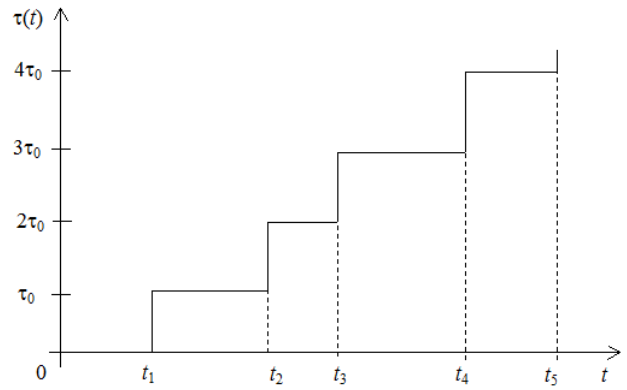

Figure 1. Model of time discrete course (taken from [1, 2])

The substitution of the Sun radiation parameters (and its size) into the theoretical description allows to estimate the initial internal Sun's time fluctuations intensity as ~ $4 \cdot 10^{22}$ s^{-1} and Earth's time fluctuations intensity as ~ $7 \cdot 10^{19}$ s^{-1}. These calculated data corresponds with experimental ones.

Is the time course discrete?

The presented experiments lead to the natural conclusion that *discrete course of time is possible*. This idea is not new and is described in numerous works, see, for example, [3]. However, it attracted my attention because of my non-standard cosmological model that I called "Theory of Spherical Expanding Universe" (SEUT) and develop since 1993. The main Idea of SEUT is to consider our Universe as a black hole in some external 4D world. The model description and arguments in favor of it were

given, e.g., in [4, 5]. Particularly, the global process of the Universe irreversible expansion in this model is explained by the matter and radiation absorption from the external word. From this idea the Universe mass M and radius $R=2GM/c^2$ growth follows. Hence, the Universe radius turns out to be some marker of its age like the wood growth rings. As a mass is equivalent to energy it turns out (surprisingly) in this model that "time transforms into energy" as N.A. Kozyrev predicted [6].

It should not think that SEUT is qualitative and speculative model. It is grounded by a numerous range of observed data and calculations of the author and other researchers. In the most cases it gives the better predictions than the Standard Cosmological Model (ΛCDM). The big contribution into demonstration of the strict proportionality between the Universe size and age was made by Prof. Fulvio Melia from Arizona University; recently he published in [7] the direct results of the redshift drift for 30 quasars during 5 years. It follows from presented data that such drift is equal to zero (and, hence, the Universe *accelerated* expansion is a myth).

So, in SEUT one associates the time course in our Universe with energy and matter absorption from outside. Such process, in my opinion, presumes that in our Universe time flows then and only then when its radius increases due this absorption and between these events time course is as "frozen".

However, the Morozov's talk led me to the elementary idea that absorbed fractions of an "external matter" have not to be infinitely small and have equal size. Contrary, it natural to assume that they are finite and different; if so, then they have probably to form just a random Poisson process.

Note, accordingly with SEUT, not only time courses, but synchronously the Universe mass and masses of its individual parts (proportionally) increase too. This means that different mass jumps may appear that create complicated local time flows.

Unfortunately, it is unclear how one could theoretically estimate in SEUT the time flow intensity that Morozov revealed. We do not know the external matter density around our Universe. If other experiments will confirm the revealed data, then we could formulate the reverse problem in order to find the external mass density.

Finally, the time flow intensity 10^{20} s^{-1} is acceptable enough. Interestingly, if we multiply this intensity by the Universe age ~10^{17} s, then we will have the dimensionless value close enough to the "extremely large" Dirac's number 10^{40}.

References

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