

Why the Universe Is Not a Computer Simulation?

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Abstract: Here, applying the Scale-Symmetric Theory (SST), we show that due to the needed very high resolution of a computer simulating the initial big bang and next the evolution of our Cosmos, we and our Cosmos cannot be a computer simulation.

Introduction and motivation

The Scale-Symmetric Theory (SST) [1] starts from the succeeding phase transitions of the superluminal non-gravitating Higgs field (HF) (it consists of the non-gravitating tachyons) during the initial big bang (the inflation). Such transitions had led to the different mass/energy scales and size scales [1A]. At the end of the inflation there were created two boundaries of our Cosmos which is much bigger than the observed Universe [1B]. All objects in the inner Cosmos and the inner boundary are built of the tachyons – it is due to their dynamic viscosity [1A]. SST shows that there is the two-component spacetime composed of the residual Higgs field associated with the gravitational fields and the Einstein spacetime (ES) (composed of the spin-1 neutrino-antineutrino pairs) associated with the Standard-Model fields [1A].

To simplify the considerations we will neglect the boundaries.

Number of free and bound tachyons in the inner Cosmos is $\sim 10^{226}$ [1B], [1A]. On the other hand, we cannot control behaviour of the tachyons and it will be never possible. Assume that some civilization is or will be able to control a field composed of the ES components (for example, their distribution and spin). Emphasize that computers are built of the ES components. We can assume that one ES component simulates behaviour of one tachyon. Then to simulate the inner Cosmos we need field composed of $\sim 10^{226}$ ES components. On the other hand, SST shows that the ES components, due to the very strong shortest-distance quantum entanglement [1A], cannot be in distance smaller than about 1.4 times greater than the Planck length [1A]. It leads to conclusion that the needed field to simulate the inner Cosmos should occupy a cube with side equal to about 10^{40} m i.e. size of it should be about 10^{10} times greater than the inner Cosmos!

Within SST we calculated as well the particle mass and wave mass (and their geometric mean that is measured in cosmology) of the neutrinos [2]. The particle mass is smallest and is about $3 \cdot 10^{-67}$ kg. It leads to conclusion that the lower limit for mass of the needed field should be about 10^{160} kg i.e. should be about 10^{40} times higher than the mass of inner Cosmos!

It is impossible to build and control such computer.

But someone can say that we can simulate a much smaller volume. The above considerations show that size of simulated region is much, much smaller than size of the field used in a computer so such simulation has no sense as well.

Notice also that the needed 3-dimensional field is only a very small part of a computer.

References

- [1] Sylwester Kornowski (2015). *Scale-Symmetric Theory*
[1A]: <http://vixra.org/abs/1511.0188> (Particle Physics)
[1B]: <http://vixra.org/abs/1511.0223> (Cosmology)
- [2] Sylwester Kornowski (27 August 2016). "The PMNS Neutrino-Mixing Matrix in the Scale-Symmetric Theory"
<http://vixra.org/abs/1608.0145>