evidence for the true vacuum by the mutual Planck particles gravitational attraction

A.V. Gordeev

NRC “Kurchatov Institute”, Moscow, Russia, [alexandergordeev@yandex.ru](mailto:alexandergordeev@yandex.ru)

The Hawking statement of the equality to zero the Universe energy because of the strict balance of the matter energy and the negative gravitation energy, can be realized by the construction of the gravitation true vacuum model inside the singularity [1]. For a unit Planck particle such balance is only partial

. (1)

However for the closely packed Planck particles the state of affairs may be different in the singularity with size  [2]. In this case the removal of a single Planck particle from its place with the size  requires the energy expenditure, that determines the hole depth . This can be verified by reversal of sign for all the energies under the fulfillment of Eq. (1) and assuming that the energies of all Planck particles are equal to zero. The final nulling of the total Planck particles energy in the singularity is determined by the collective attraction of the Plank particles. The following evolution consists in the Planck particles decay into the charged particles with the energy

 (2)

with the further their annihilation to the electromagnetic field

, (3)

resulting in the energy flux from the singularity  [2,3].

The gravitational energy, released by the Planck particles decay in the singularity, reduces to the zeroth total energy.

The magnitude of this flux is consistent with the result of the dimension analysis of the limiting flux energy for the existing fundamental constants 

, (4)

where the brackets denote the dimension of the corresponding quantity.

The formation of the Planck particle vacuum under the mutual Plank particles attraction is similar in a sense to the arising of the superconductivity as a result of the electron pair attraction near the Fermi-surface [4].

References

1. [Hawking S.W. From the Big Bang to Black Holes.Toronto-New York-London. 1987.
2. Gordeev A.V.//44-th International Zvenigorod Conference on Plasma Physics and on Conttrolled Fusion, Zvenigorod, 13 -17 February, 2017. Book of Abstract, p.232.
3. Gordeev A.V.//40-th International Zvenigorod Conference on Plasma Physics and on Controlled Fusion, Zvenigorod, 11 -15 February, 2013. Book of Abstract, p. 207.
4. Lifshitz E.M., Pitaevskii L.P. Course of Theoretical Physics, v.9. Statistical Physics, Part 2. Butterworth – Heinemann 1980. 2013.