

# THE EQUATION OF VACUUM STATE AND THE STRUCTURE FORMATION IN UNIVERSE

© 2019 S.L. Cherkas<sup>1\*</sup>, V.L. Kalashnikov<sup>2</sup>

*Institute for Nuclear Problems, Bobruiskaya str. 11, Minsk, 220050, Belarus<sup>1</sup>*

*Institute of Photonics, Vienna University of Technology, Vienna A-1040, Austria<sup>2</sup>*

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The vacuum is considered as some “fluid” emergent from the zero-point fluctuations of the quantum fields contributing into the vacuum energy density and pressure. The equation of vacuum state and the speed of vacuum sound-waves are deduced under the assumption of zero vacuum entropy. Evolution of the background space-time metric resembles that of the Milne’s-like universe. In the framework of the five-vector theory of gravitation allowing an arbitrary choice of the energy density reference level, the dynamics of the vacuum, pressureless matter, and space-time metrics perturbations is traced under this background. The obtained results show the very early formation of the Universe structure without the need of dark matter. Thus, a vacuum can be considered as some type of the dark-energy-matter unification.

**Key words:** vacuum fluctuations, density and pressure of vacuum, Milne’s-like universe, factor of the matter inhomogeneity growth

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\* E-mail < [cherkas@inp.bsu.by](mailto:cherkas@inp.bsu.by) >