

Neutrino quantum decoherence due to the interaction with matter.

The phenomenon of neutrino oscillations arises due to the coherent superposition of neutrino mass states. The interaction between neutrinos and the external environment can disrupt this coherent superposition. This disruption is called neutrino quantum decoherence, and it leads to the suppression of flavor and spin-flavor oscillations. Previously, in [1–2] we presented a novel theoretical framework based on quantum field theory of open systems applied to neutrinos that allowed to describe the neutrino evolution taking in to account the neutrino decay. In this talk we present our studies on the process of neutrino quantum decoherence due to the neutrino scattering on external electron environment.

[1] K. Stankevich, A. Studenikin, Neutrino quantum decoherence engendered by neutrino radiative decay, Phys. Rev. D 101 (2020) 056004.

[2] A. Lichkunov, K. Stankevich, A. Studenikin, M. Vyalkov, Neutrino evolution and quantum decoherence, J.Phys.Conf.Ser. 2156 (2021) 1, 012240.

Section

Neutrino physics and nuclear astrophysics

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