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NEUTRINO OSCILLATION IN AN ANISOTROPIC COSMOLOGICAL MODEL

Abstract

The determining factor for the physics of processes and for the expansion dynamics of Universe in the anisotropic cosmological model is the behaviour of neutrinos and antineutrinos of all kinds during a sharp anisotropic expansion at a time when the temperature has dropped so much that processes with neutrinos are already proceeding rather slowly compared to the rate of change of the system parameters and the thermodynamic equilibrium for neutrinos is broken. It is assumed that after a certain moment the probability of interaction of neutrinos with other particles and between itself is small, neutrinos become free. In this case, the component of the neutrino momentum along the axis, which occurs compression, increases due to the "blue" shift. The distribution of neutrino momentum becomes sharply anisotropic, elongated in the direction of compression, and the energy of each neutrino increases. In this stage, the neutrinos generated by the mixing of charges oscillate. Neutrino oscillations are real if the masses are equal, virtual if the neutrino masses are not equal. Expressions are obtained for mixing angles and oscillation lengths for three neutrino oscillations.