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AMPLIFICATION OF THE ENERGY OF COSMIC RELIC NEUTRINOS

Abstract

We present the results of our calculations of the average energy of the scattered relic cosmic neutrinos in the scattering of the incident relic neutrinos at transversely polarized ultra-relativistic electrons in a magnetic field. Our aim is to determine the physical conditions that enable us to amplify the energy of relic neutrinos. When the magnetic field strength is much less than the Schwinger field strength and the energy of the electrons in the initial state are sufficiently high (but less than the unitarity limit), the average energy of the scattered neutrinos is proportional to the energy of the electrons in the initial state and is sensitive to the neutrino flavor and the spins of the electrons in the initial and final states. The electrons transfer essential part of their energy to the neutrinos and the energies of the scattered relic neutrinos can reach even several hundreds of GeV.