Abstract:

We review the process of the two-step conversion of the neutrino helicity, $\nu_L \to \nu_R \to \nu_L$, in the supernova conditions, where the first stage is realized due to the interaction of the neutrino magnetic moment with the plasma electrons and protons in the supernova core. The second stage is caused by the neutrino resonant spin-flip in a magnetic field of the supernova envelope. Given the neutrino magnetic moment within the interval $10^{-13} \mu_B < \mu_\nu < 10^{-12} \mu_B$, and with the existence of the magnetic field at the scale $\sim 10^{13}$ Gauss, between the neutrinosphere and the shock-wave stagnation region, it is shown that an additional energy of the order of 10^{51} erg can be injected into this region during the typical time of the shock-wave stagnation. This energy could be sufficient for stimulation of the damped shock wave.