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Neutrino Oscillation in Supernovae and Its Influence on Nucleosynthesis

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During a supernova (SN) explosion, a huge amount of neutrinos are emitted from a proto-neutron star. These neutrinos change their flavors by neutrino oscillation. In the O/C and He/C layers, the flavor change occurs by the MSW effect and, therefore, the average energies of ν_e and $\bar{\nu}_e$ increase. The increase in the average neutrino energies enhance the effect of charged-current neutrino-nucleus reactions so that the yields of light elements produced through the ν-process increase. Recently, the flavor change by neutrino self-interaction has been discussed. Since the flavor change occurs in the innermost region of SN ejecta, it could affect neutrino-nucleus reactions in such a deep region. I would like to talk about neutrino oscillations in SNe, including the MSW effect and neutrino self-interaction, and the change of neutrino energy spectra in SNe. I also would like to discuss the influence of the neutrino oscillation on the nucleosynthesis of light elements produced through the ν-process and heavy elements produced in the innermost region of the SN ejecta.