

NEUTRINOS AND NUCLEOSYNTHESIS OF HEAVY ELEMENTS

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Neutrinos emitted in core-collapse supernovae play the essential role in determining the outcome of heavy-element nucleosynthesis in the neutrino-driven winds. It has been shown that neutrino oscillations among the active flavors [1,2] or between the active and sterile flavors [3,4] may have substantial impact on the neutron richness of the ejecta, thereby altering the nucleosynthesis result. However, the feedback of flavor oscillations on the dynamics, thermodynamics, and/or the matter composition of the winds is of ten neglected. We have developed a wind model in which the complete treatment of neutrino flavor oscillations and the associated feedback in the dynamical evolution are self-consistently treated. The influence of this improvement on the nucleosynthesis of heavy elements will be discussed.

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[4] M.-R. Wu et al., Phys. Rev. D 89, 061303 (2014).