Supernova Neutrino-process nucleosynthesis with neutrino self-interaction and MSW effects\textsuperscript{1} GRANT MATHEWS, University of Notre Dame, HEAMIN KO, Soongsil University, MYUNG-KI CHEOUN, Soongil University, EUNJA HA, Soongsil University, MOTOHIKO KUSAKABE, Beihang University, TAKEHITO HAYAKAWA, NQRST, HIROKAZU SASAKI, TOSHITAKA KAJINO, NAOJ, MASA-AKI HASHIMOTO, Kyushu University, MASAOMI ONO, RIKEN, MARK USANG, SATOSHI CHIBA, Tokyo Inst. Tech, KO NAKAMURA, Fukuoka Univ., ALEXEY TOLSTOV, KENICHI NOMOTO, IPMU, TOSHIHIKO KAWANO, LANL — The $\nu$-process is a unique nucleosynthesis mechanism that only affects the abundances of some rare nuclei. There are, however, uncertainties due to the neutrino mass hierarchy, neutrino oscillations and the neutrino self-interaction. In this talk we discuss calculations of the abundances of $^7$Li, $^{11}$B, $^{92}$Nb, $^{98}$Tc, $^{138}$La, and $^{180}$Ta produced by the $\nu$-process. We consider the modification both by the $\nu$ self-interaction near the neutrinosphere and the Mikheyev-Smirnov-Wolfenstein effect in the outer layers based upon time-dependent neutrino energy spectra from core-collapse supernova simulations. Abundances of $^7$Li and heavy isotopes $^{92}$Nb, $^{98}$Tc and $^{138}$La are reduced by a factor of $\sim 2$ by the $\nu$-self-interaction. In contrast, $^{11}$B is relatively insensitive. We find that the abundance ratio of heavy to light nuclei, $^{138}$La/$^{11}$B, is a robust probe of the neutrino mass hierarchy, and the normal mass hierarchy is more likely to be consistent with the solar meteoritic abundances.

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