The Weak S-Process in Massive Stars[1] XINYAN XIANG, Carleton College, XINYAN XIANG COLLABORATION — The weak $s-$process occurs in massive stars with $M \geq 8 M_\odot$ during convective core He burning and shell C burning, and synthesizes stable isotopes up to a mass of A $\approx$ 100. Computing the weak s contributions to the solar abundances is more sensitive to cross-section uncertainties compared to the main component, and previous stellar models have difficulty obtaining the needed weak s-only isotopic abundances without also overproducing others. In this work, we calculate the weak component of the s-process. The weak s solar abundances are taken as residuals from previous computations for the main s component. To investigate possible differences in neutron exposures between both the main and weak components and the He-core and C-shell sites within the weak component itself, we complete the calculations using different neutron exposure distribution models: a linear combination of exponential distributions, a superposition of exponential distributions, a Gaussian distribution, and a Planck distribution. The solutions to the differential equation are assessed by tuning the fraction f of ^{56}Fe seed nuclei and characteristic neutron exposure τ_0 as fit parameters.

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