The s process in rotating low-mass AGB stars: Nucleosynthesis calculations in models matching asteroseismic constraints

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We investigate the s-process during the AGB phase of stellar models whose cores rotate at rates consistent with asteroseismology observations of their progenitors and successors. We calculate $2M_{\odot}$, Z=0.01 models, rotating at 0, 125, and 250 km/s at the ZAMS. An artificial, additional viscosity is added to enhance the transport of angular momentum in order to reduce the core rotation rates to be in agreement with asteroseismology observations. For the first time, we present nucleosynthesis calculations for rotating AGB models that match the asteroseismic constraints on rotation rates of MS, RGB, He-burning and WD stars. In particular, we calculated one model that matches the upper limit of observed rotation rates of core He-burning stars. We also included a model that rotates one order of magnitude faster than the upper limit of the observations. The s-process production in both of these models is comparable to that of non-rotating models, which means the observed spread in s-process production cannot be accounted for by rotating models. However, there are uncertainties remaining in the treatment of rotation in stellar evolution, as well as magnetic processes. We will briefly discussed this.