ON THE EXISTENCE OF THE LEPP MECHANISM

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The study of s-process elements is a powerful tool to reconstruct the chemical evolution of our Galaxy. In fact, due to the rather poor knowledge of the stellar conditions characterizing the r-process, it is a common procedure to determine r-process abudances as residuals starting from s-process abundances (r=1-s). Following this procedure, [1] postulated the existence of an unknown mechanism (the Light Element Primary Process, LEPP) needed to reproduce the solar abundances of elements belonging to the first s-process peak (Sr-Y-Zr). The same mechanism has been invoked to reproduce the abundances of light s-only isotopes (i.e. isotopes without an r-process contribution) with $90<A<130$. This hypothesis has been recently confirmed by [2], but strongly questioned by [3], whose models do not necessarily imply the existence of the LEPP mechanism. Both groups derived their conclusions by varying only the mass extension or the ^{13}C mass fraction within the ^{13}C-pocket, the major neutron source in low mass AGB stars. Here, we evaluate the effects of different prescriptions for the treatment of the radiative/convective interfaces in full evolutionary stellar models coupled to a full nuclear network [4]. Moreover, we consider additional sources of uncertainty, such as Galactic Chemical Evolution code input parameters (IMF,SFR,...), the presence of rotation-induced mixing, the pre-AGB mass-loss and nuclear uncertainties.

[1] C. Travaglio et al., ApJ 601, 864 (2004).
[2] S. Bisterzo et al., ApJ (2014, arXiv:1403.1764).
[3] O. Trippella et al., ApJ (2014, arXiv:1403.6256).
[4] S. Cristallo et al., ApJ 696, 797 (2009).