FRUITY upgrades on AGB nucleosynthesis

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Asymptotic Giant Branch (AGB) stars are among the major polluters of the interstellar medium. These objects produce both light (C,N,O,F,Na) and heavy elements (via the slow neutron capture process, the s-process). In AGB stars the main neutron sources are the $^{13}C(\alpha,n)^{16}O$ reaction, mainly working in low-mass AGB stars (LM-AGBs, $1.2 \leq M/M_{SUN} < 4.0$), and the $^{22}Ne(\alpha,n)^{25}Mg$ reaction, mostly at work in intermediate-mass AGB stars (IM-AGBs, $4.0 \leq M/M_{SUN} \leq 6.0$).
Our AGB models are available on-line at the web page of the FRUITY database [1]. New sets of AGB models are presented here: a first one including a full range of IM-AGBs at different metallicities (4.0, 5.0 and 6.0 M_{SUN} with $-2.15 \leq [Fe/H] \leq +0.15$) and a second one of LM-AGBs including rotation ($0 \leq v_{ROT} \leq 120$ km/s).
We show how the two neutron sources differently contribute, as a function of the initial mass, to the IM-AGBs surface patterns [1]. We present comparisons with available spectroscopic data at different metallicities. Moreover, current uncertainties affecting s-process branchings (as the one at ^{85}Kr) are discussed.
Secondly, we discuss the effects that the inclusion of rotation has on the LM-AGBs nucleosynthesis. In these objects the dominant neutron source mostly burns in radiative conditions; thus, the presence of rotational mixing during the interpulse phase lead to appreciable changes in the final s-process surface distributions [3]. Comparisons with spectroscopic observations and SiC grain isotopic compositions are shown.

[1] S. Cristallo et al., ApJS 197, 2 (2011).
[2] O. Straniero et al., ApJ 785, 77 (2014).
[3] L. Piersanti et al., ApJ 774, 98 (2013).