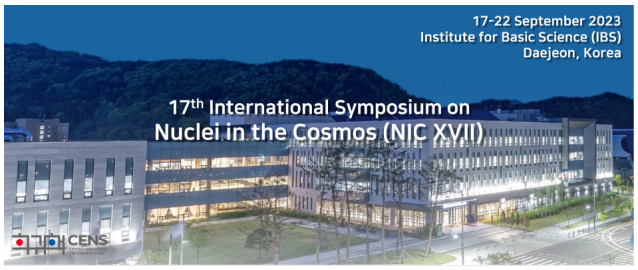

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Production of solar abundances for nuclei beyond Sr: do we need better nuclear physics input?

Tuesday, 19 September 2023 18:10 (5 minutes)

It is widely accepted that the slow (s-process) and rapid (r-process) scenarios of neutron captures contribute to the solar abundances of trans-Fe nuclei.
The yields of up-to-date and totally independent models for s- and r-process show a general good and complementary agreement in reproducing the Solar System abundances. However, some local discrepancies do occur and this fact could hint to a contribution by another nucleosynthesis mechanisms (e.g. the i-process) as well as the need for more precise nuclear physics inputs to be used for the nucleosynthesis calculations. In particular in last years the need for new (theoretical and hopefully experimental) estimates for the beta decay rates in stellar plasma conditions of some key isotopes has been highlighted. We present an analysis of the s-process contributions to Sr–Pr region from recent models of
asymptotic giant branch stars, for which uncertainties are known to be dominated by nuclear effects.
In particular, we will focus on for four nuclei (98Mo, 106Pd, 118Sn, and 135Ba) whose predicted abundances are in clear disagreement with observed ones and whose s-process yields will be crucially modified if the half-lives of some isotopes (i.e. 113,115Cd, 115In, and 134,135Cs) would be different in ionized plasma environments.

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