

LOW-ENERGY ENHANCEMENT IN THE γ STRENGTH WITH IMPACT ON ASTROPHYSICAL REACTION RATES

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The recent discovery at the Oslo Cyclotron Laboratory of a low-energy increase in the γ strength function of light and medium-mass nuclei [1] has the potential of increasing neutron-capture rates up to two orders of magnitude for very neutron-rich nuclei [2], see Fig. 1. The presence of this increase at low γ energies has very recently been confirmed in ⁹⁵Mo from data taken at the Lawrence Berkeley National Laboratory [3]. However, the question is whether this structure persists when approaching the neutron drip line.

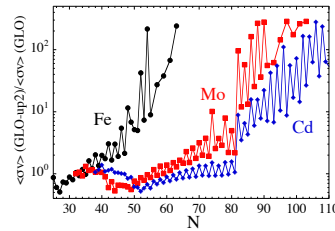


Figure 1: Ratios of Maxwellian-averaged (n, γ) reaction rates at $T = 10^9$ K using a γ strength with a low-energy increase (GLO-up2) and without (GLO) [2].

In this talk, the present status of the low-energy increase will be discussed. Fresh data on Cd and Fe isotopes will be presented. For the latter, data taken with large-volume LaBr₃(Ce) crystals borrowed from the INFN-Milano group will also be showed. Calculations of reaction rates and the possible impact on the stellar r-process will also be discussed.

References

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