

THE NEW KADONIS v1.0 AND ITS INFLUENCE ON S-PROCESS NUCLEOSYNTHESIS

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Five years after the release of KADoNiS v0.3 (www.kadonis.org) [1], a major update on the s-process database has been completed and it is presently available for debugging. 370 datasets between ¹H and ²¹⁰Bi and their energy dependence for $kT= 5 - 100$ keV have been reviewed, updated, and evaluated. The up to now missing light isotopes ³He, ⁶Li, and ^{10,11}B were added and recommendations based on experimental data given. Light isotopes with changes of more than 10% in the (n, γ) cross section are e.g. ¹H, ¹⁴N, ^{16,18}O, ^{20,22}Ne, and ²⁵Mg.

In this update also indirect measurements, namely (γ ,n) measurements complemented by Hauser-Feshbach predictions with constrained input, have been included which yielded new (n, γ) recommended values for e.g. the branchings at ⁸⁵Kr [2], ¹⁸⁵W, and ¹⁸⁶Re [3]. For other branching isotopes, e.g. ⁶³Ni, first direct experimental time-of-flight data [4] yielded a factor of 2 higher cross section compared to the previously used theoretical prediction.

The influences of the changes in the (n, γ) cross sections of important isotopes like ¹²C, ¹⁶O, and ²⁵Mg on the weak s-process have been investigated.

The new KADoNiS v1.0 database is part of an established effort aiming to align nuclear astrophysics experiments with stellar simulations, with the final goal to understand how heavy elements are made in stars.

[1] I. Dillmann, R. Plag, F. Käppeler, T. Rauscher, *Proc. of the workshop "EFNUDAT Fast Neutrons - scientific workshop on neutron measurements, theory & applications" held on April 28-30 2009 at Geel, Belgium*

[2] R. Raut, A.P. Tonchev, G. Rusev et al., *Phys. Rev. Lett.* 111 (2013) 112501.

[3] T. Shizuma, H. Utsunomiya, P. Mohr, et al., *Phys. Rev. C* 72 (2005) 025808.

[4] C. Lederer et al. (the n_TOF collaboration), *Phys. Rev. Lett.* 110 (2013) 022501.