# SYNTHESIS OF HEAVY AND SUPERHEAVY NUCLEI IN INTENSIVE NEUTRON FLUXES OF EXPLOSIVE PROCESSES

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The model of heavy elements production under condition of pulse explosive nucleosynthesis was developed in 1985 [1] – 1990 [2] years. Later on this model was extended by including effects connected with adiabatic expansion of matter and adopted for pulse conditions of very short in time nuclear explosion [3]. The model was also extended for binary starting target-isotopes compositions [4] - adiabatic binary model (ABM). Also this modified method with new data base was used for the description of superheavy elements (SHE) production in astrophysical processes [5]. And now we have two models connected by the similar algorithm for the heavy and superheavy elements production in intensive neutron fluxes of the rapid – r-process nucleosynthesis.

When process is shot in time ($t \leq 10$ s for astrophysical events and $t < 10^{-6}$ s for nuclear explosion) so we may speak about the explosive processes. In this case the possibility of SHE production in astrophysical explosive processes is strongly depends on the parameters of processes, because it may be not enough time to rich the island of stability for SHE. In the prompt process of nuclear explosion we have another problem connected with the nuclear data in the region of very neutron-rich heavy and superheavy nuclei and their stability to the beta-delayed and spontaneous fission processes. All these problems are analyses in this work and the probabilities of heavy and superheavy nuclei production in intensive neutron fluxes of explosive processes are discussed for the Supernova and thermonuclear explosions.

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1. Yu.S.Lyutostanskii *et al*. // Sov. J.Nucl. Phys. 1985. V.42. P.136.
2. Yu.S.Lutostansky, V.I.Lyashuk, I.V.Panov // Bull. Russ. Acad. Sci. Phys. 1990. V.54. P.2137.
3. V.I.Lyashuk // Bull. Russ. Acad. Sci. Phys. 2012. V.76. No.11.
4. Yu.S.Lutostansky, V.I.Lyashuk, I.V.Panov // Bull. Russ. Acad. Sci. Phys. 2011. V.75. P.533.
5. I.Petermann, K.Langanke, G.Martinez-Pinedo, I.V.Panov, *et al*. // Eur. Phys. J. 2012. V.48. P.122.