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BETA-DECAY RATE IS AN IMPORTANT FACTOR OF THE R-PROCESS HEAVY NUCLEI FORMATION.

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More than the half of all nuclei heavier iron in nature are formed in the nucleosynthesis, supported by rapid neutron capture process, and the region where it has occurred lies close to neutron drip-line [1]. The nucleosynthesis rate of heavy nuclei in the r-process is defined both by the astrophysical scenario and beta-decay rates of heavy nuclei involved. Under speeding up or slowing down the nucleosynthesis wave movement into the region of more heavier nuclei, the trajectory of the r-process is changed as well as the position of the third peak on the abundance curve of heavy nuclei [2], that is pointing out on the complicated influence of the beta-decay model on nucleosynthesis.
Using the results of heavy nuclei abundances calculations in the r-process in the scenario of neutron stars merger the sensitivity of the results on input data was determined. The influence of different theoretical models of beta-decay on abundances of heavy nuclei was investigated.
In the nucleosynthesis calculations global beta-decay half-lives predictions based on different microscopic models [3, 4, 5] have been used. The calculations have confirmed the strong beta-decay model influence on heavy nuclei nucleosynthesis process. Comparison of the results have shown that dependence of average nucleosynthesis rate value on existed theoretical models of beta-decay is weak. But even the moderate change of the rate leads to the shift of platinum peak position in comparison with observations and strong discrepancy in abundances. All these results have shown that for reliable predictions of heavy nuclear abundances the more prominent microscopic models [6] are needed.

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Primary author: PANOV, Igor (ITEP)

Presenter: PANOV, Igor (ITEP)

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