Phenomenological model of $\beta$-delayed neutron emission

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$\beta$-delayed neutron emission is one of the processes that may affect the nucleosynthesis path, and the final abundance pattern, of elements created in the r-process. Since many of the nuclides involved in this process are currently beyond experimentally known region, nuclear theory modeling is needed to provide the input data.

A phenomenological model of the $\beta$-delayed neutron emission will be presented. It is based on the $\beta$-strength function calculated with an effective density model. The de-excitation via neutrons is modeled with sequential emission based on statistical nuclear level density and simplified competition with $\gamma$-rays emission. It will shown that this method results in a significantly reduced predictions of two- and three-delayed-neutron probabilities compared to the so-called cut-off method. Predictions for some selected isotopes, soon to be studied experimentally, will be also presented.