

# Experiment-calculated method for determination of prompt neutron lifetime in fast metal cores intended for verification of neutron transfer simulation codes

*Thursday 21 April 2022 10:40 (2 hours)*

Here described a method for determination of mean prompt neutron lifetime in fast metal cores during critical experiments held in RFNC –VNIITF using assembly machine FKBN-2. The evaluation of derivative using experimental dependence between asymptotic decrease coefficient and core parts gap  $\alpha(H)$  was proposed further to determination of the delayed critical state of the core. The value characterizes the transient prompt neutron process in the core and accurate within coefficient determines the mean prompt neutron lifetime in the system. By-turn the coefficient may be calculated using contemporary neutron transfer simulation. The experimental results of and routine criticality experiments data may be used for verification of computer codes and cross section databases.

Approbation of the method was held using fast metal cores of U and Pu in different mass ratio. The experiments were performed on assembly machine FKBN-2 leaded by time-correlated measurements. Benchmark experiment modeling was carried out and Monte-Carlo simulation was done for critical and time-correlated experiments using different cross section databases.

## Country/Int. organization

Russian Federation

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**Session Classification:** Poster Session

**Track Classification:** Track 5. Test Facilities and Experiments