Experimental Research of Prompt Neutrons Kinetics in Multiplying Systems with Plutonium Core

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In addition to the presented before in an International Handbook [2] (V.1c, PU-MET-FAST-022) critical parameters of a "bare" (with no reflector) assembly of ^{239}Pu (98%) in δ-phase, in RFNC-VNIIEF there are experimentally determined kinetic characteristics: Rossi- α_0 constant, effective fraction of delayed neutrons $\beta_{eff.}$ and lifetime of prompt neutrons $\tau_{0.}$

New experimental data widen the list of benchmark parameters for an assembly of ^{239}Pu (98%) in δ-phase and make it possible to increase testing quality of neutron-physics data.

There are compared and analyzed the results of kinetic characteristics measurements for the assembly of ^{239}Pu (98%) obtained in RFNC-VNIIEF to the data for a similar American assembly of ^{239}Pu (95.5%) Jezebel (LANL) [3], [4].

The comparison demonstrated that the values obtained in VNIIEF with the use different equipment at various times coincide with each other within the error of measurements and, at the same time, essentially differ from the data obtained in LANL (divergence - ~15% at the declared measurement error of ~2%). The analysis of kinetic characteristics measurements for Jezebel assembly (LANL) revealed the possible reason of systematic errors that could have taken place in the experiments [3].

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