

POSSIBILITY FOR SEPARATING A SHORT-LIVED COMPONENT ($T_{1/2} = 1$ ms) IN TOTAL QUANTITY OF DELAYED NEUTRONS FROM PHOTOFISSION OF ^{238}U AT REGISTRATION PULSES BETWEEN ELECTRON LINAC PULSES

Fission of actinide nuclei produces fast neutrons, mainly "prompt" neutrons (PNs), but also (2%) "delayed" neutrons (DNs with different half-lives $T_{1/2}$). Usually, for the sake of convenience, DNs are divided into 6–8 groups according to their $T_{1/2}$ -values at approximately $0.2 \text{ s} < T_{1/2} < 56 \text{ s}$ (see, e.g., [1]). But there are some indications that it is necessary to search for short-lived DN components with $T_{1/2}$ down to 1 ms (see, e.g., [2]).

In previous works [3–5], we tried to find such short-lived DN components in time intervals between pulses of the linear electron accelerator LUE-8-5 of the INR RAS [6] at the incident electron energy $E_e = 10 \text{ MeV}$, the duration of each beam pulse $3 \cdot 10^{-6} \text{ s}$, and their repetition rates $(50\text{--}300)\text{s}^{-1}$. As we showed in [4], under such conditions, after about 7 min of irradiation with beam with stable parameters, flux of all DN components with $0.2 \text{ s} < T_{1/2} < 56 \text{ s}$ will be almost constant at an aggregated saturation level (except for some statistical fluctuations). Under these conditions, the sought short-lived component of DN components will give an addition to this level which will decrease exponentially with increasing of t –time after beam pulse (from $t = t_0$ –start of each measuring interval).

In the present work, we considered possibility for separating a short-lived component with $T_{1/2} = 1 \text{ ms}$ from total quantity of DN components at photofission of ^{238}U in dependence on its characteristics (namely, a_i –the relative part of the i -th group of delayed neutrons), as characteristics of used registration process (values of t_0 and levels of accumulated "statistics").

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Author: DZHILAVYAN L.Z. 1 (Institute for Nuclear Research of the Russian Academy of Sciences, Moscow, Russia)

Co-authors: LAPIK A.M. 2; NEDOREZOV V.G. 2; PONOMAREV V.N. 2; RUSAKOV A.V. 2

Presenter: DZHILAVYAN L.Z. 1 (Institute for Nuclear Research of the Russian Academy of Sciences, Moscow, Russia)

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