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## Neutron response function of CeBr3 detector for 1.25-5.75 MeV neutron energy range.

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Neutron response function of CeBr3 detector for 1.25-5.75 MeV neutron energy range.

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The results of measurements of neutron detection efficiency  $\epsilon(E_n)$ ,  $E_n \approx 1.25 \div 5.75$  MeV for scintillation CeBr3 detector of MULTI setup [1] are presented. The measurements of the energy dependence of efficiency  $\epsilon(E_n)$  were carried out by tagged neutron method using  $^{239}\text{Pu}/^9\text{Be}$  n- $\gamma$  source.

Trigger-detector was used for registering  $\gamma$ -quanta  $E_\gamma = 4.44$  MeV accompanied by  $\sim 60\%$  of events of neutron emission from source  $^{239}\text{Pu}/^9\text{Be}$ . Neutron energy values was taken from the time of flight (TOF) measurements.

The  $\epsilon(E_n)$  measurements have shown that CeBr3 detector have a relatively high neutron detection efficiency which is weakly dependent on the energy values in the region  $E_n \approx 1.25 \div 5.75$  MeV. For example, efficiency is  $\epsilon(E_n) \approx 24.6\%$  in energy range  $E_n = 1.25 \div 5.75$  MeV at the threshold 60 keV for CeBr3 detector ( $5 \times 5 \times 5$  cm<sup>3</sup>). It was found that efficiency have strong dependence on threshold values, see Fig 1. The mean efficiency  $\langle \epsilon \rangle$  as a function of threshold values is presented in Fig 1.

In comparison stilbene detectors that are often used for neutron detection have good n- $\gamma$  pulse shape separation, but sharp energy dependence of the efficiency  $\epsilon(E_n)$ .

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