

A POSSIBILITY OF NEUTRON REGISTRATION IN BROAD ENERGY RANGE USING HYBRID SOLID STATE GAS DETECTOR BASED ON 10B LAYER

Thursday, 5 October 2017 17:10 (15)

A two-dimensional hybrid solid state gas detector [1] is used for neutron registration in fluxes enriched by fast or thermal neutrons. Computer simulation of amplitude distribution of detector pulses indicates a possibility to register thermal as well as fast (1-10 MeV) neutrons. As a result of simulation amplitude spectra corresponding to different neutron input energies and for different active gas layers of the detector are obtained.

The operation of the detector was studied using W-Be photoneutron source at the Institute for Nuclear Research in fluxes with variable ratio of fast and thermal neutrons. Measured amplitude spectra and amplitude correlations for different neutron energies are compared with simulation results. A good agreement between experimental and simulated spectra indicates a possibility of using this detector to detect neutrons in broad energy region. In particular, the detector should be used for determining the conditions of obtaining optimal ratio of fast and thermal neutrons needed in various experiments.

1. S Potashev, Yu Burmistrov, A Drachev, S Karaevsky, E Konobeevski and S Zuyev. IOP Conf. Series: Journal of Physics: Conf. Series 798 (2017) 012160.

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Session Classification : Facilities and advanced detector technology - 2

Track Classification : Facilities and advanced detector technologies