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## Simulation of spectra of cylindrical neutron counters using the GEANT-4 package

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It is commonly supposed that the amplitude spectrum of the helium proportional counter at irradiation by thermal and cold neutrons has a peak of full absorption with the energy of 768 keV and two small “shelves”, caused by boundary effects from falling of charged particles (of proton or tritium nucleus) in the detector wall. Simulation of the amplitude spectra of cylindrical counters with different gas filling is presented in the paper. The possibility of the third peak, not coinciding with that of full absorption, is shown, while the peak position depends on the ratio of the path length to the counter diameter. The results obtained may be of interest in the development of low efficiency neutron detectors and neutron monitors.

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