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TIME-OF-FLIGHT CORRECTION METHOD FOR SETUPS WITH HEAVY CRYSTALS

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In nucleus-nucleus collisions at energies up to 2 GeV, neutrons constitute a significant fraction of secondary particles. For their registration and identification, it is proposed to use modules of a High Granularity Neutron Detector (HGND). The detector has a layered structure, where each active layer consists of individual cells. This work considers the possibility of replacing passive layers with active layers made of a high-density scintillator — bismuth orthogermanate $Bi_4Ge_3O_{12}$ (BGO). However, the use of BGO for time-of-flight (TOF) measurements is complicated by the long signal rise time (>100 ns) and requires the development of specialized electronics (amplifier). The report presents a time-of-flight data analysis method applied to data obtained during testing of a BGO crystal with the developed amplifier on an experimental test bench. Additionally, the results of simulations of a prototype detector based on BGO crystals are presented.

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