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A detector for neutron time of flight spectrometry

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Time of flight neutron spectrometry requires for high detection efficiency. In this work we present a detector which is based on a neutron-gamma converter (^{10}B disk) followed by a gamma detector (BaF_2). The response function to convert time of flight spectrum to energy one was constructed. About four times higher efficiency, compared to an equal thickness ^6Li -doped typically-used neutron detector is predicted. The well-known $^7\text{Li}(p,n)^7\text{Be}$ reaction is used to compare the calculated detector response with the measured one. The low energy tail of the neutron spectrum is well reproduced.

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