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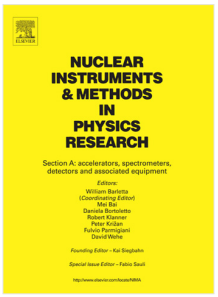

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Preliminary characterization of a CdZnTe photon detector for BNCT-SPECT

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Abstract

The effectiveness of Boron Neutron Capture Therapy (BNCT) treatment depends on the amount of radiation dose deposited locally by the reaction $^{10}\mathrm{B}(n,\alpha)^{7}\mathrm{Li}$ in the tumour; however, the local and real time measurement of this quantity during the neutron irradiation is a big challenge. To evaluate the dose it is necessary to know the spatial distribution of the ^{10}B concentration and thermal neutron flux in the tissue during the irradiation.

One technique to solve this problem relies on the on-line detection of the 478 keV ^{7}Li de-excitation photons that can be used to map the spatial distribution of the reaction rate of the $^{10}\mathrm{B}(n,\alpha)^{7}\mathrm{Li}$. The present work has been developed within a project aiming to develop a Single Photon Emission Computed Tomography (SPECT) system based on CdZnTe (CZT) semiconductor detector.

This work studied the performances of a 5x5x20 mm^3 CZT prototype de-

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