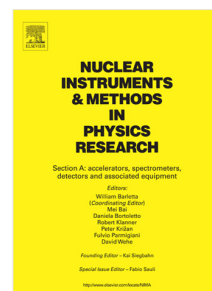


Accepted Manuscript

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PII: S0168-9002(18)30805-2
DOI: <https://doi.org/10.1016/j.nima.2018.06.068>
Reference: NIMA 60929

To appear in: *Nuclear Inst. and Methods in Physics Research, A*

Received date : 31 January 2018
Revised date : 27 May 2018
Accepted date : 25 June 2018

Please cite this article as: S. Fatemi, S. Altieri, S. Bortolussi, I. Postuma, G. Benassi, N. Zambelli, M. Bettelli, M. Zanichelli, A. Zappettini, N. Protti, Preliminary characterization of a CdZnTe photon detector for BNCT-SPECT, *Nuclear Inst. and Methods in Physics Research, A* (2018), <https://doi.org/10.1016/j.nima.2018.06.068>

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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 $^{10}\text{B}(n, \alpha)^7\text{Li}$ 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 ^7Li de-excitation photons that can be used to map the spatial distribution of the reaction rate of the $^{10}\text{B}(n, \alpha)^7\text{Li}$. 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 $5 \times 5 \times 20 \text{ mm}^3$ CZT prototype de-

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