

Fig. 3 (color online) Space resolution of the detector with cosmic-ray testing.

the track for pad plane of the drift time and the time resolution of drift direction. On the readout pad plane, the prototype achieved a position resolution of 473 μm for cosmic ray tracks and a position resolution of 19.9 ns in the drift direction.

Reference

[1] D. R. Nygren, J. N. Marx. Phys. Today, 31, 10(1978)46.

6 - 3 Energy Response of Detector in Pulsed Neutron Field

Gong Yiwei^{1,2}, Luo Peng^{1,2}, Wen Zhiwen¹, Xu Junkui^{1,2}, Huang Yuxuan¹, Ran Jianlin¹, Song Shiyu¹, Tang Xiaoqin^{1,2} and Chen Zhiqiang^{1,2}

¹Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou 730000, China;

²School of Nuclear Science and Technology, University of Chinese Academy of Sciences, Beijing 100049, China)

In this work, simulation analyses were carried out using Monte-Carlo MCNPX code to obtain the energy response of silver detector, which is used in pulsed radiation fields as well as in continuous radiation fields with neutron energies ranging from thermal up to 5 GeV. The detector consists of two silver-covered plastic scintillators and two tin-covered plastic scintillators, which are arranged tightly with a photomultiplier tube, and surrounded with four spherical layers. The silver-covered plastic scintillators and the tin-covered plastic scintillators are placed in a compact and symmetrical way. Besides, signals of tin-covered plastic scintillators are subtracted from those of silver-covered plastic scintillators in order to eliminate the photon sensitivity for the neutron measurements. The working principle of silver detector is summarized by the following two reactions:

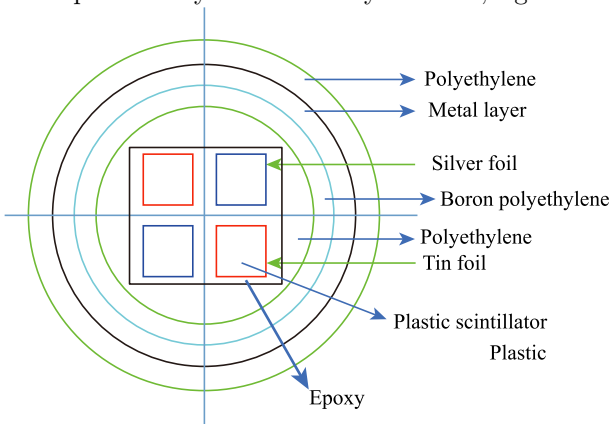
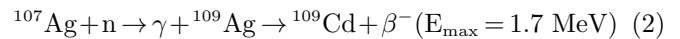


Fig. 1 (color online) The structure diagram of silver detector.

The working principle of silver detector is summarized by the following two reactions:



The silver detector has the advantage of reducing the impact of dead time in pulsed radiation fields. In addition, it can be applied for continuously monitoring and recognize the change of neutron dose level in few seconds. The silver detector has been processed and is now waiting for experimental testing. The structure diagram of this detector is shown below.

References

[1] Abdulah Mohammad Shehada, Valery Pavlovich Krivobokov, Radiation Physics and Chemistry, 189(2021)109732.
 [2] M. Luszik-Bhadra, E. Hohmann, Th. Otto, Radiation Measurements, 45(2010)1258.