

Recent Advances of Photo-Detectors in Single Photon Emission Computed Tomography Imaging System

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Abstract : One of the main techniques for Positron emission tomography (PET), Single photon emission computed tomography (SPECT) is the development of radiation detectors. The NaI(Tl) scintillator crystal coupled to an array of photomultiplier tubes known as the Anger camera, is the most dominant detectors system in PET and SPECT devices. Technological advances in many materials, in addition to the emerging importance of specialized applications such as preclinical imaging and cardiac imaging, have encouraged innovation so that alternatives to the Anger camera are now part in alternative imaging systems. In this paper we will discuss the main performance characteristics of detectors devices and scanning developments in both scintillation detectors, semiconductor (solid state) detectors, and Photon Transducers such as photomultiplier tubes (PMTs), position sensitive photomultiplier tubes (PSPMTs), Avalanche photodiodes (APDs) and Silicon photomultiplier (SiPMT). This paper discussed the detectors that showed promising results. This study is a review of recent developments in the detectors used in single photon emission computed tomography (SPECT) imaging system.

Keywords : SPECT, scintillation, PMTs, SiPMT, PSPMTs, APDs, semiconductor (solid state)

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