Performance Evaluation of a new Digital Brain PET based on the Plug&Imaging Sensor Technology

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Introduction

Positron Emission Tomography (PET) is a 3D-imaging technique that is often used to functional information of biochemical processes from living tissues and PET images are currently important in many medical applications. The challenging factor of PET analysis is low sensitivity and poor spatial resolution. In recent years, new and advanced detector technologies have been studied to increase the detection efficiency of PET systems. In this work, we describe a novel Digital Brain PET prototype we have assembled using the Oy softened crystal design. The detector is a combination of scintillator crystals and the last electronic module. The former allows for a high solid angle, while the latter provides high spatial and time resolution. Performance results of the prototype were compared to that of the commercial CrystalNest system (Siemens). The performance of the prototype was better than the commercial system in terms of sensitivity and energy resolution. The PET system was assembled using the Oy softened crystal design technology, which provides high sensitivity and spatial resolution. The prototype shows a high sensitivity and a high spatial resolution, which is comparable to the commercial system. The PET system was also tested using the NEMA NU-2 standard. The results show that the sensitivity of the prototype was better than the commercial system. The energy resolution of the prototype was also better than the commercial system.