

easyPET: an innovative concept for an affordable tomographic system

Functional imaging is the state of the art in cancer diagnostics, monitoring of therapy effects and cancer drug development. Position Emission Tomography (PET), notably when combined with Computed Tomography (CT), has a recognized superiority over conventional imaging modalities. Cost and complexity are issues worth being considered as limiting factors in the adoption of PET technology.

The easyPET proposed here is an innovative concept, patented by Aveiro University, expected to reduce pre-clinical PET systems complexity and cost. It is based on pairs of scintillating crystals coupled to Silicon Photomultipliers (SiPMs) placed on a rotating mechanism with two degrees of freedom to cover the field-of-view of a conventional preclinical PET system. A prototype has been realized with a single detector pair as a demonstrator in 2D.

The paper reports the prototype qualification and optimization in terms of image contrast, sensitivity and spatial resolution. The encouraging results compared to the performances of commercially available systems motivate a feasibility study to produce a preclinical system with 3D imaging provided by multi-pair detectors.

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