Docket #: S12-088

A method to obtain uniform positioning accuracy, resolution, and sensitivity within monolithic scintillation detectors for positron emission tomography

This invention enables depth-of-interaction detection of Positron Emission Tomography (PET) without sacrificing other performance parameters or escalating the cost. The optical coupling method eliminates “edge-artifacts” which normally degrade the performance and restricts the use of monolithic scintillation detectors in PET scanners. Since the scintillation light distribution is preserved at the monolithic crystals' edges, the depth-of-interaction information at the edge is just as good as near the center of the crystal. In addition, this method provides uniform spatial resolution and sensitivity throughout the PET system at a much lower cost compared to the segmented crystal design generally used in PET scanners.

Stage of Research:
Proof of concept through simulations

Applications

- Monolithic scintillation detector
- Positron Emission Tomography (PET)

Advantages

- For monolithic scintillation detector:

- Improves positioning accuracy

- Eliminates “edge artifacts”
- For a PET system:
- Cost-effective alternative to other designs- saving near $100K
- Accurate photon depth of interaction information
- Uniform spatial resolution
- Improves image quality and sensitivity

Patents

- Published Application: 20130299707
- Issued: 9,151,847 (USA)

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