

## Development of a Four-Layer Depth of Interaction Detector Based on a 6 x 6 SiPM Array for MR-PET

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We are developing a PET scanner which has both depth-of-interaction (DOI) and time-of-flight (TOF) information and can be placed close to a MRI scanner. Here we evaluated the positioning and energy performances of a four-layer DOI detector which consists of a single-layer of a 16 x 16 Lu<sub>2</sub>(1-x)Gd<sub>2</sub>xSiO<sub>5</sub> (LGSO) crystal array, a light guide, and a 6 x 6 SiPM (MPPC: S10985-050C, Hamamatsu Photonics) array. The size of each crystal element was 2.9 mm x 2.9 mm x 20.0 mm. The four layers DOI encoding is allowed by changing the reflector arrangement of each layer. As results, the four-layer DOI encoding method worked successfully and good energy resolution of 12.9% has been obtained. Further details of experimental results including the timing performance will be presented at the workshop.

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