

# Development of a MR-Compatible DOI-PET Detector Module

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Silicon Photomultiplier (SiPM) is a promising sensor for PET detector which is able to work normally in the MR environment. In this paper, we developed a compact DOI-PET detector based on an 8x8 SiPM (MicroFB-30035-SMT) array and two layers of LYSO arrays. A 15x15 top layer placed half crystal offset on a 16x16 bottom layer and then coupled to the SiPM array. Size of the LYSO crystals in both layers is 2x2x7mm<sup>3</sup>. Sixty-four channels of SiPMs are multiplexed by an ASIC chip with in-chip resistor networks into 3 analog outputs and then fully digitized by 3 ADC chips. The energy is calculated by averaging the 3 points around the peak of the pulse. Experiments with two <sup>22</sup>Na point sources were studied. The results show that the detector module achieves good crystal identification capability and energy resolution in both layers.

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