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Development of a SiPM based DOI-PET detector module using depth-dependent reflector pattern within a single layer scintillator

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A depth-of-interaction(DOI) PET detector has been developed based on a single layer scintillator coupled to the Silicon photomultiplier(SiPM) with depth-dependent reflector patterns. The DOI method uses different reflector patterns which varies distribution of lights according to the interaction depth. A crystal block consisted of 24×12 array of lutetium yttrium oxyorthosilicate(LYSO) crystals with a dimension of 2.1 mm × 2.1 mm × 20 mm, optically coupled to the 8×8 SiPM array with a size of 3 × 3 mm and pixel pitch of 3.36 mm. To evaluate the detector performance, a flood image was obtained with Na-22 gamma source. In the flood image, 24×12 of LYSO pixels are clearly distinguished and two layers in depth are well separated. The result proved that this DOI method can be applied to the preclinical PET for high resolution imaging.

Has accepted

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