Development of an Ultra-Tiny Hand-held Compton Camera for Minimum Spaces
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We will demonstrate on newly developed ultra-tiny hand-held Compton Camera, which is able to be inserted into minimum spaces such as a laparoscopic port or ducts in nuclear power plants.

Keywords: Gamma ray Imaging, Compton Camera

1. Introduction

In the surgical fields, intra-operative ¹⁸F-FDG detection has been required for less-invasive surgery [1]. We have developed an ultra-tiny hand-held Compton camera, which is able to be inserted into laparoscopic ports to be placed as close as possible to objects to enhance its efficiency and spatial resolution.

2. Material and Methods

Our Compton camera consists of Though Silicon Via (TSV) type Multi Pixel Photon Counters (MPPCs, HAMAMATSU, S12892PA-50), relatively new semiconductor photo detector, coupled one-by-one to GFAG scintillator crystals (2 x 2 x 3 mm³) [2]. It has diameter of ø11.8 mm and 4 layer of 12 pixels cross-shape MPPC-GFAG array (Fig. 1).

3. Results and Conclusion

For a shielded ²²Na source where individually placed 10 mm in front of the detector of the center and the left top, these reconstruction images were clearly resolved and spatial resolution of 4 mm (FWHM) was achieved (Fig.2). Other imaging results and read-out electronics will also be presented on the conference.

References