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Design and Fabrication of Endoscope-Type Compton Camera

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We are constructing an endoscope coupled with radiation detector, and its real time radiation imaging system. The imaging system is based on Compton camera composed of a digital signal-processing unit with ASIC and FPGA and reconstruction algorithm using spherical harmonics that can compute in real time. Acquired data are immediately transferred to a host PC and computed by a reconstruction algorithm, and reconstructed image is displayed one after another. In this paper, we show some simulation results on the performance of the system using EGS5, Monte Carlo simulation code. We have also fabricated a prototype Compton camera using two array-type semiconductor detectors, a Si array and a CdTe array, whose sizes are less than 10mm x 10mm.

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