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Performance evaultion for pinhole collimators of small gamma camera by MTF and NNPS Analysis; Monte Carlo simulation st

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Presently the gamma camera system is widely used in various medical diagnostic, industrial and environmental fields. Hence, the quantitative and effective evaluation of its imaging performance is essential for design and quality assurance. The NEMA standards for gamma camera evaluation are insufficient to perform sensitive evaluation. In this study, MTF(modulation transfer function), NNPS(normalized noise power spectrum) will be suggested to evaluate gamma camera performance with changeable pinhole collimators using Monte Carlo simulation. We simulated the system with a cylinder and a disk source, and seven different pinhole collimators from 1mm- to 4mm-diameter pinhole with lead. The MTF and NNPS data were obtained from output images and were compared with FWHM, sensitivity and differential uniformity. In the result, we found that MTF and NNPS are effective and novel standards to evaluate imaging performance of gamma cameras instead of conventional NEMA standards.

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