

was superior to the FFT method as noise of data increase or as number of projection decrease, (2) at least 20 projection data in increment 10 degrees

should be required, and, on the these premise, (3) the quality of positron reconstruction images seems to be satisfactory.

A New Type Parallel-hole Collimator—Geometrically Coincident Collimator of Clinical available Size

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A new type parallel-hole collimator—geometrically coincident collimator of clinically available size was made.

“Geometrically Coincident” means that each 28,000 holes of eight interspaced lead plates coincides from the bottom to the upper surface with regard to gamma ray direction.

1) Structure

The size of the collimator was 262 mm effectively and its thickness was 29.5 mm. The collimator was consisted of eight interspaced lead plates, each of which has 28,000 circular holes and triangularly arrayed in 1.5 mm pitch.

Between each lead plate of 1.0 or 1.5 mm thickness was interspaced with Aluminum holder with 28,000 holes. Therefore, the weight of this collimator was markedly reduced to 30% as compared with the commercially straight-bore collimators of the same size with 28,000 holes.

2) Structural accuracy

A study of the appearances of Moirè pattern effects was conducted for each two lead plates by optical examinations.

It was concluded that the structural accuracy was ascertained within error of $\pm 20 \mu$ by the above method.

3) Collimator performances

Geographical resolution of this collimator in FWHM (mm) was obtained by optical measurement method. The result showed that FWHM was 0.91 mm and 1.25 mm at the source to the collimator distance of 10 mm and 100 mm distance, respectively. The overall resolution in FWHM (mm) of this collimator in combination with the camera detector systems was superior to that of the conventional camera systems, using ^{99m}Tc source.

Dynamic Scanner: Imaging System Employing a Flying Spot X-ray Microbeam Generator

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Employing an X-ray generator which produces a bright and fine X-ray microbeam, a new computer assisted tomography (CAT) system was developed. The projected X-ray beam is so fine that images are less diffuse than those of conventional CAT systems. Besides, this system can quite easily be synchronized with physiological signals such as electro-cardiographic trigger. The X-ray microbeam can be scanned by the trigger signal from ECG's R wave and thus one can

obtain the section images of different phases of cardiac cycle. Unlike the other CAT systems, this system allows taking a plain X-ray scanning image, while leaving the patient at the same posture for transverse axial tomography mode. This procedure, if applied before the tomography, provides a great advantage of confirming the portion of the patient's body where the transverse axial tomography is required. Scanning mode of X-ray also produces highly-precise quantitative X-