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

M. AKISADA*, and T. YAMAGUCHI**
*Department of Radiology, The University of Tsukuba, **Hitachi Denshi Co. Ltd.

A new type parallel-hole collimator—geometrically coincident collimator of clinically avoilable 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 appearaces 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

G. UCHIYAMA*, N. ARIMIZU*, M. KAWANA*, T. NOSE*, H. TANAKA*, Y. TATENO**, T. IINUMA**, M. ENDO** and T. RIKITAKE**
*Department of Radiology, Chiba University School of Medicine, **Clinical Research Div., Institute for Radiological Sciences, Chiba

Employing an Xray 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-prcise quantitative X-

ray images with a great reduction of radiation dose to the patient.

The image chamber is cylindrical and measures about 70 cm in diameter. The X-ray generator and a line-shaped scintillation detector are rotated around the imaging chamber by a digital servo-drive system. The X-ray generator of this instrument is essentially an electron microscope equipped with heavy metal target. Electron beam is generated from an electron optical lens onto the target. The beam is acceralated by high voltage up to 140 kV, and impinge onto the tungsten target of 140 mm diameter as a fine focal spot. Before hitting the target, the electron beam is rapidly and accurately deflected by a coil in accordance with positional instructions from a computer or a scan generator. High intensity X-rays pass through a pinhole and form an X-ray microbeam. Transmitted X-rays through the patient body are detected by sodium iodide scintillation crystals. Beside the line-shaped crystal, a large round crystal of 16 inch diameter is equipped for the two-dimenstional scanning X-ray images.

Clinical Evaluation of Domestic High-Resolution Scinticameras

G. UCHIYAMA, N. ARIMIZU, M. KAWANA, Y. KUNIYASU, T. NOSE, J. NAGASE, K. SAEGUSA, A. ARIMA, K. AKEZUMA, T. YAMAMOTO and K. WATANABE
Department of Radiology, Chiba University School of Medicine

The purpose of this study is to evaluate the superiority of the new domestic high-resolution scinticameras to the ordinary ones in the quantitative data handling of their dynamic images. Toshiba Jumbo GCA-401 and Hitachi RC-1C-1635DL were so far available.

Toshiba camera along with a high-resolution collimator (46,000 holes) have the resolution of 3.2 mm in the bar phantom study which was achieved by the circuitry revision. Hitachi camera with a high-resolution collimator (67,000 holes) gave the resolution of 2.0 mm, which was achieved by lessening the thickness of sodium iodide crystal from —12.7 mm to 9 mm.

These high-resolution cameras were proved to be useful for the radionuclide angiography of the brain (including Moyamoya disease), heart (initial pass studies and gated studies), and transpanted kidneys.

On the Performances of Image Display Processor Model IDP-2

K. TAKEMURA*, S. NAKANISHI*, M. TODA*, Y. HIROSE* and H. OYAMADA**
**Shimadzu Seisakusho Ltd.*, ***National Cancer Center Hospital*

The Image Display Processor Model IDP-2 is a hard-wired device which performs the recording of scintigrams on the cassette tape and displays processed scintigrams by simple push-button or dial operation.

The recording of scintigram and display of it after processing are carried out simultaneously, and the otpmum scintigram can be obtained by repeating the playback for several photo-recording conditions. Also patient code can be recorded in cassette tape with scintigram for the convenience of searching data for a patient to be studied.

Image is displayed on X-ray film(14s × 17s at maximum) and CRT (5s × 4s) with maximum two hundred image elements for one scanline. Every element has couts accumulated in every 1.5 or 3.0mm interval.

The Processor has such functions as the addition and the subtraction of data from upper and lower detectors, 3 or 9 points smoothing, isocount display, and R.O.I. selection.

The photo-scintigrams on X-ray films can be obtained under such various recording conditions as Cut off, Contrast Enhancement, and Informa-