

the plane of interest. As the detector moves and collects information about the plane of interest, that plane's image will appear clearly on the CRT.

Although in one back and forth motion of the detector head, only one plane's image clearly appears on the CRT, the information about the points on all the other planes is stored in the VTR in that one motion of the detector head.

It is only a matter of simple computer processing to focus on other planes.

Result

Tomographic imaging with a scintillation camera having a large field of view

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An apparatus for tomographic imaging of radioisotope distribution in human has been constructed. Its principle is the same as one devised by groupes of Chiba University and Nuclear Chicago Co. A 30° slanted parallel hole collimator which is attached to a scintillation camera with delay line arithmetic rotates about its central axis at a constant speed of one revolution per minute, while a top of a table is moved in a circular motion. The camera consists of a NaI(Tl) crystal of 38.7 cm in diameter viewed by thirty photomultiplier tubes. It provides a field of view having a diameter of 34 cm. The intrinsic spatial resolution of the camera in X and Y directions are 8.4 and 8.0 cm (FWHM) for a ^{57}Co source, respectively.

In tomographic imaging the longitudinal re-

3 cylinders 6 mm in diameter and 6 cm in length, containing 100 μCi of ^{75}Se -Selenomethionine, were placed at 5 cm, 10 cm and 15 cm from the surface of the collimator. The cylinder which was focused on appeared clearly in the same position and with the same features on the CRT, while the other cylinders appeared on the CRT but moved as the detector head moved and were thus blurred. A clinical application of this method was performed on a patient with meningioma.

solution as well as the transverse resolution is required to be better. Response function of the system to a point source was theoretically derived and given by a Gaussian function modified by a modified Bessel's function of zero order. Tomographic effect can be evaluated by calculating the response function. An index of the longitudinal resolution was defined here to be a distance from the focal plane, where the FWHM value of the response to a point source becomes twice that of the response to a point source in the focal plane.

According to this definition, the present system had the longitudinal resolution of 1.8 cm with the transverse resolution of 1.6 cm (FWHM) for a ^{57}Co point source located 10 cm from the collimator surface.