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DESIGN OF WHOLE BODY POSITRON COMPUTED
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A whole body positron computed tomogra
phy is under construction. It consists of a
scanner, a patient bed, an operator's con
sole with CRT displays, and an image proc
essing system. For fine and uniform data
sampling, the scanner is designed to have
rotary detector rings spaced unequally for
three detector units. Three detector rings
are mounted to produce images for five slices
simultaneously. One detector ring contains
40 detector units, each unit having four
15x24x24 mm 960 crystals and two pho
tocouplers. The coincidence circuits are
mounted on the rotary disk with the rings
and the detector address signals for coinci
dence events are transmitted to the image
processing system through specially design
ated rotary photocouplers. A minicomputer,
Hitac-LOE/L, is used for the image proc
essing system with a data acquisition inter
face and an image reconstructor. The time
for the reconstruction of a 256 x 256 image
is about 10 seconds.

This work was conducted under contract with
the Agency of Industrial Science and Science
and Technology, MITI, Japan.

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IMPROVEMENT OF WOBBLE SCAN FOR POSITRON CTS.
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Many positron CT systems employ wobble
scans to improve spatial resolution. The
most important design parameters for wobble
scans are the number of measuring points and
the diameter of the wobble circle. These
parameters affect spatial resolution and
noise quantity in reconstructed images of
positron CTs. Deciding these parameters is
vital in the design of new positron CT
systems.

The present study investigates the
effect of wobble diameter and number of
measuring points on positron CT performance
by computer simulation. Simulations are
made of the whole body system. The number
of detectors is 160 and the detector ring
diameter is 850 mm. This investigation
demonstrates that the optimum diameter of
the wobble circle can be found if the
number of measuring points is fixed.

The effect of half angle rotation is
also studied. Half angle rotation does
not improve spatial resolution. (9 wobble points
and optimum wobble diameter 0.75D. D is
detector spacing.)

This work is contracted by the Agency of
Industrial Science and Technology, the
Ministry of National Trade and Industry.

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COINCIDENCE ELECTRONICS FOR MULTISLICE
POSITRON EMISSION COMPUTED TOGRAPHY.
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In the design of a coincidence elec
tronics system it is required to attain
high count rate capability and to simplify
the electronics. Our computed tomograph
consists of 3 circular detector rings and
is capable of providing 5 slices of the
human body. The detectors of one ring are
divided into 10 groups and each detector
is in coincidence with those of opposing
5 groups. The coincidence electronic system
is composed of two coincidence circuits
and each circuit detects coincident events
in two intra slices and one inter slice.
The coincidence of 25 combinations among
the detector groups is detected independ
ently each other to attain high count ca
pability. This system is also capable of
detecting random coincident events. The
maximum count rate is 2-Mcps per 5 slice.
This work has been performed under con
tract with the Agency of Industrial Sci
ence and Technology, MITI, Japan.

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TRIAL PRODUCTION OF BOLUS INJECTOR FOR RI
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of Medicine, Chiba.

The dynamic flow study of nuclear medi
ine is required to deliver a bolus of ra
dionuclide. There are several methods for RI
bolus injection. In these methods, Yale
New Haven's method is effective one, but
this method needs, at least, two experienced
staffs for rapid successive radionuclide
delivery. And yet often we couldn't aquire
a good bolus. Comparing to the other me
thods, our devised syringe (serial double
barrel syringe with bipolar needle) is
possible to deliver a bolus rapidly and
serially, and is easier to handle. Addition
ally, residual volume of radionuclide is
lower. Our injector is constructed by
double syringe, separated with rubber tip,
and by bipolar needle. From the completely
inserted condition of all compartment, 1.
pull the plunger, and load the desirable
volume of saline into the inner syringe. 2.
Slightly pull the inner syringe and draw
out from the inner needle. 3. Pull the
inner syringe as the piston of the outer
syringe, and load the outer syringe to its
desired volume of radionuclide. 4. When the
plunger is pushed in, radionuclide and
saline are discharged by rotation and
serially. The common syringe shield is available for
this injector.