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MaxiCamera 400T AUTOTUNE ZS SYSTEM.  
N. Tanaka Yokogawa Medical Systems, Ltd.  
 Tokyo.

MaxiCamera 400T AZS Scintillation camera has revolutionary electronics feature called "Autotune ZS", which allows to improve basic camera performance, while reducing the need for frequent camera "tuning" by service technician. The Autotune feature allows the imaging detector to be automatically retuned many times per second, substantially eliminating annoying camera "drift", while enhancing diagnostic images. This unique circuit automatically retunes each individual photo multiplier tube (PMT) many times per second. Each tube has a reference source which is an order of magnitude more stable than a PMT. This dynamically tuned detector provides the stable base necessary for energy and linearity corrections. Spatial (Linearity) distortions are major cause of nonuniformities in Anger scintillation cameras. Nonuniform response to gamma event energy at different positions across the face of the detector is another major cause of system nonuniformity. MaxiCamera 400T AZS has unique both energy and spatial distortion correction device, which provides real time, precise spatial and energy correction. With this device the system can be asymmetrically peaked for optimal resolution with no sacrifice in uniformity.

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DEVELOPMENT OF THE SUPER-JUMBO DIGITAL GAMMA CAMERA WITH LARGE FIELD, SQUARE DETECTOR. H. Iwao, H. Watanabe, T. Kuriwa, Y. Nanjo, T. Yamakawa, T. Ichihara, M. Tsutsumi, T. Iwasaki, J. Habara and N. Kumano (Toshiba, Nasu Works)

This is a multi-purpose Gamma camera equipped with a large field, square detector and incorporating a data processing function as standard equipment. Designed for efficient nuclear medical diagnosis, it is capable of performing single-photon ECT imaging, as well as ordinary and whole-body imaging operations. The square detector has achieved improved performance thanks to energy and linearity correction, despite the effective field as large as 35cm x 50cm. The detector rotation and the ballancing-type radius adjustment of rotation are manual, making its positioning very easy. In whole-body imaging with moving stand, a maximum 50cm x 195cm image can be obtained by single scan. In ECT imaging with a diameter of 35cm, it is possible to collect data at one time over an axial distance of 50cm or 35cm. High-speed image reconstruction has been achieved by the use of a high-speed arithmetic unit. It is an extremely easy-to-operate system which allows the performance of various operations from the console, ranging from setting of detector conditions to data collection of various types, as well as processing of nuclear medical data including ECT image reconstruction.

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NEW TYPE SCINTILLATION CAMERA ZLC 370/750.  
 N. Shibahara, T. Matsuyama, S. Wakabayashi. Shimadzu Corp. Kyoto.

ZLC™ 370/750 is a new type and compact camera system with counter balanced stand. This is a easy-operated system. Rotating Mechanics (ORBITER™) provide 365° orbit at radius of rotation in order to enable ECT (Emission Computed Tomography). Performance specifications are improved due to nonlinearity and energy correction (ZLC™) shown in Table 1. As a console, Digital Operator's Terminal (DOT™) or SCINTIVIEW™ II can be selected. DOT enables conventional studies. SCINTIVIEW II enables various processing such as cardiac analysis, renal analysis and so on. Ten kinds of collimators are prepared, particularly low energy collimators are light and exchangeable easily.

Table 1. Performance Specifications Based on NEMA Standards

Parameter	ZLC 370	ZLC 750	Comment
No. of PMT	37	75	*FWHM (Tc-99m)
Field of View	38.7 cm		Guarantee value in CFOV
Intrinsic	*Spatial Resolution	≤4.9 mm / ≤3.7 mm	
	Integral Uniformity	±6.0%	
	Absolute	<0.50 mm	
Maximum Count Rate	>200 Kcps		20% Window

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TIME RESOLUTION OF γ-RAY DETECTOR WITH BaF<sub>2</sub> SCINTILLATOR. Y. Yamashita. Hamamatsu TV Co., Ltd.. Hamamatsu.

In the TOF positron CT using the time-of-flight information of the positron annihilation γ-rays, detectors are required to have good coincidence time resolution. CsF crystal (decay time:2.5ns) has been used as a scintillator for this application. Recently BaF<sub>2</sub> crystal is making a strong impact to the TOF positron CT because of very short decay time equal to 800 ps and non-hygroscopic nature. BaF<sub>2</sub> has fast and slow decay components each of which has different spectra. The emission peak of the fast component is 220 nm. In order to get good time resolution, photomultiplier tube is required to have high quantum efficiency, high collection efficiency and fast time response in this UV region. New photomultiplier tube which provides the performance above mentioned was developed. The good time resolution equal to 330 ps in FWHM for 511 keV annihilation γ-rays was obtained combined with 25 mm dia x 25 mm BaF<sub>2</sub> crystals. This is superior to that with CsF(400 ps) so that will improve a signal to noise ratio in reconstructed image of TOF positron CT.