

Performance stability of SHR-2000 high resolution PET for animal research

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The performance of a high resolution positron emission tomography (PET) system SHR-2000 for animal studies was re-evaluated six years after its installation. The system employs a detector array consisting of BGO crystals that are 1.7 mm (transaxially) by 10 mm (axially) by 30 mm (deep). A block detector, which is a position-sensitive photomultiplier tube (PMT) coupled to 4 arrays of BGO crystals has been adopted to the system. There are 15 block detectors positioned to form a 35 cm diameter ring with a field of view (FOV) of 17 cm by 4.6 cm axially, giving the system a 7 slice imaging capability. For six year workload in spatial resolution (FWHM), there were approximately a 2.6% increase at tangential FOV and a 7.5% increase at radial FOV. In axial resolution (FWHM) there was almost no change. The count rate loss for the true count rate increased 1.3% at 200 kBq/ml. The average slice sensitivity showed a decrease of approximately 4.1%, and in scatters it showed an increase of approximately 1.4%. In animal experiments, the bones of guinea pigs were clearly identified with ^{18}F fluoride ion. These experiments show that after a six year workload, the system also maintains good performance and has good stability.

Key words: animal PET, physical performance, stability