

INITIAL RESULTS OF THE EXPLORE VISTA SMALL-ANIMAL POSITRON EMISSION TOMOGRAPHY/COMPUTED TOMOGRAPHY



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The performance of a newly introduced PET/CT system for small-animal imaging (eXplore VISTA/CT, GEHC) is presented. An annular PET detector system based on phoswich scintillators and PS-PMTs and a microresolution x-ray scanner have been integrated in a unique gantry with adjacent FOVs that are and mechanically registered. This configuration permits easy acquisitions of both anatomical and functional images in a single machine using a unified protocol. The CT can be operated in different modes ranging from fast, low-dose (< 60 HU SD for 5 cGy), low-resolution (200 μm) for animal position or accurate attenuation correction of the functional image to high-resolution (50 μm) mode for accurate 3D reconstructions. Planar projection angiography is also feasible for dynamic studies with contrast. The CT is based on a microfocus X ray tube and a solid-state in cone-beam geometry.

Image reconstruction is done with a modified Feldkamp algorithm. Filtering of the x-ray beam, dual-energy acquisitions, and gating are also supported. The PET section relies on the explore VISTA system, which has been integrated together with the CT without any mechanical or functional modification, thus preserving all its intrinsic specifications (resolution = 1.6 mm FBP, sensitivity = 4.0% for 250-700 keV). Although when the system can be used as PET or CT, a new developed protocol handles the multimodality acquisition optimizing the experiment procedures and minimizing the time per animal in the scan. Resulting images come intrinsically registered, allowing an integrated and effortless display and analysis.