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Dedicated breast CT[1]

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Dedicated breast computed tomography (CT) systems were designed and fabricated in our laboratory, and patient scanning commenced in November 2004. The breast CT scanner was designed utilizing several off-the-shelf components, including the x-ray system, the flat-panel detector, and a position encoder - bearing - motor system. These components were integrated into a custom designed scanner frame and gantry. The breast CT scanners utilize a 17 second acquisition during patient breath-hold, and during this time 500 projection images are acquired over 360 degrees around the breast. The radiation levels are adjusted such that the mean glandular dose is equal to that of two-view mammography for each woman. As of November 2008, over 180 patients have been scanned. Of these, about 40 were imaged with and without contrast agent injection. We have also imaged 4 patients using an integrated PET system. Initial evaluation indicates that high-quality tomographic images of the breast can be achieved at dose levels comparable to two view mammography. The ultimate utility of breast CT may include breast cancer screening, diagnostic imaging, robotically controlled biopsy, and other interventional procedures.

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