

Mammography Tomosynthesis Using a Coupled Source and Detector In a C-Arm Configuration.

A digital tomosynthesis method has been implemented for use with isocentric stereotactic breast biopsy units with digital imaging capabilities. Tomosynthesis is the process of reconstructing planes of interest at any level in an object from limited angle projection data in a manner similar to conventional focal plane tomography. Niklason, et.al (Radiology 1997;205:399-406), using a full field digital mammographic system with a stationary detector geometry, demonstrated that tomosynthesis can improve lesion margin visibility especially in radiographically dense breasts. The method implemented in this work reconstructs planes orthogonal to the zero projection angle axis, as well as planes tilted relative to the axis of tomographic motion from an imaging system using a coupled source and detector in a c-arm configuration. The images are collected on a Lorad stereotactic prone breast biopsy unit with a 1024 x 1024 digital image receptor. Image quality is evaluated in terms of the line spread function, low contrast detectability, and ACR stereotactic accreditation phantom target visibility, including the dependence of image quality on image receptor exposure values and number of projections.