AbstractID: 1131 Title: Characterization of Mammography Tomosynthesis Performance Using A C-Arm Coupled Source and Detector

Digital tomosynthesis is an imaging technique to produce a tomographic image from a series of angular digital images in a manner similar to conventional focal plane tomography. Unlike film focal plane tomography, the acquisition of the data in a C–arm geometry causes the image receptor to be positioned at various angles to the reconstruction tomogram. The digital nature of the data allows for input images to be combined into the desired plane with the flexibility of generating tomograms of many separate planes from a single set of input data. Angular data sets were obtained of phantoms utilizing a Lorad stereotactic biopsy unit with a coupled source and digital detector in a C-arm configuration. Tomographic images were reconstructed using iterative subtraction techniques with removal of out-of-focus planes, and an iterative reconstruction technique similar to Algebraic Reconstruction (ART). These were compared with standard single view digital radiographs. Tested indicators of quality are Signal to Noise Ratio (SNR), Contrast to Noise Ratio (CNR), Signal to Background Ratio (SBR). The method's effectiveness at removing the blurred images of out-of-plane structures from the target plane was quantified in terms of the SNR, CNR and SBR. Imaging and reconstruction was also performed on a cadaver breast. The technology proved effective at partially removing out of focus structures and enhancing SNR, CNR and SBR. The SNR, CNR and SBR all improved as the number of projections was increased. The ART created images with greater clarity, and less blur, than did the iterative subtraction technique.