

AbstractID: 1733 Title: Comparison of a Portable Cone-Beam Device to Conventional CT for Image Guided Therapy

An amorphous Silicon detector was used for image acquisition on a C-arm device for use as a portable tomographic imaging system. The reconstruction was achieved using a modified Feldkamp cone-beam algorithm over a half circle arc. Image quality is investigated with a focus on its use as a tool in image guided radiotherapy. Image quality is compared to that of a commercial fan-beam CT scanner. Loss of contrast in the C-arm images occurs mainly due to increased noise inherent in cone beam configurations. This is seen more acutely in low density structures than in high density structures. Water to air contrast is 98.78% and 35.86% for fan beam and cone beam respectively. In Bone to water, contrast was 46.75% for fan beam and 22.47% for cone beam. Spatial resolution is slightly better in the cone beam image (10 lp/cm for cone beam, 8 lp/cm for fan beam), most likely due to filtering in the reconstruction of the fan beam image. Without filtering, artifacts are present in the cone beam reconstruction; however, significant distortion is not seen. Tomographic scans from this device can be useful in guided therapy. Because of its portability, it is ideal for use in the treatment room. Improvements in the image quality are needed, particularly in the area of reduction of artifacts and noise from scattered rays.

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