

AbstractID: 1820 Title: A Mechanical Solution for Patient Positioning using Cone-Beam CT Acquired with a Mobile C-Arm

A prototype mobile C-arm device has been evaluated as a potential tool for daily verification of patient setup accuracy. The C-arm is equipped with an amorphous silicon flat panel and is capable of cone beam reconstruction. The flat panel is 40 cm by 30 cm with an intrinsic resolution of 2048 x 1536. The reconstruction resolution can be set to (128 x 128 x 96), (258 x 258 x 192), or (512 x 512 x 384). A necessary step in using the C-arm is the registration of the acquired images with the LINAC isocenter. A mechanical solution has been developed that is capable of locating the LINAC isocenter in the patient's 3D image volume. Using this information the images can be compared to planning CTs or acquisitions on subsequent days. The uncertainty in the procedure is  $\pm 0.4$  mm in the Superior Inferior direction,  $\pm 0.2$  mm in the Anterior Posterior direction, and  $\pm 1.3$  mm in the lateral direction. The primary source of error is the uncertainty in the table read out. In the procedure the table is rotated about its column, creating the largest uncertainty in the lateral direction. The magnitude of the overall error shows the feasibility of such a solution.

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