

AbstractID: 7624 Title: Treatment planning for large patients with anatomy outside of imager FOV

**Purpose:** A 3D dose distribution for a large patient is usually obtained by projecting the treatment fields on to digitized wire contours, resulting in the loss of all anatomical information. This study evaluates a more accurate approach of obtaining a full volumetric image set for patients that cannot be completely imaged within the available field of view.

**Method and Materials:** Two laterally shifted CT scans of an anthropomorphic pelvic phantom with fiducial markers were acquired, each simulating the CT scan of a large patient with missing anatomy resulting from the limited FOV. A complete scan of the phantom was also performed for comparison purposes. In the TPS, an empty phantom image set was created with very large FOV. Both shifted scans were fused with this image set by aligning the point intersected by the fiducial markers on the CT image to the Dicom origin of the empty set. All the contours can be copied from the CT scans into the empty image set, to provide a complete fused contour set. This method was evaluated by comparing a 3 field plan created on the fused contour set with a similar plan on the complete scan.

**Results:** The contour set was successfully fused into the empty image set. Partial scan of the phantom can be overlaid inside the contour set to permit visualization of the anatomy. The differences between the two plans in the SSDs for the AP, RtLat, and LtLat fields were 4.0, 1.0, and 1.0 mm, respectively, and the differences in isocentric doses for these fields were 0%, 0.7%, and 0.2% respectively.

**Conclusion:** Entire patient contours for large patients can be accurately contoured by fusing multiple CT scans, each acquired with different patient positioning. This will allow obtaining accurate 3D dose distribution and DVH for target volumes and critical structures.