

AbstractID: 1144 Title: Correcting Daily Setup Variations for Breast Irradiation with Tangential Photon Beams

Information in the electronic portal image was explored for the detection and correction of daily setup variations in the treatment of breast carcinoma with tangential photon beams. A computer algorithm determines from the treatment portal image the central lung distance (CLD), the distance from the breast apex to the inferior field edge (BAIFE), and the distance from the breast apex to the lateral field edge (BALFE). The feasibility and sensitivity of automatically detecting setup variations was tested on a Rando phantom with a breast attachment. Portal images of the phantom were obtained using an amorphous silicon detector (Bioscan SA) with known displacements of the phantom. The detector was attached to the gantry of the accelerator at a source to detector distance of 1.6m. Images were obtained with 1 monitor unit corresponding to 1 cGy at beam isocenter at depth of dose maximum. It was found that a 1mm displacement of the phantom: (1) toward the gantry increased CLD 0.6mm and decreased BALFE 0.7mm; (2) anteriorly increased CLD 0.9mm and decreased BALFE 0.8mm; and (3) superiorly, increased BAIFE 1mm. A 1 degree roll of the phantom on the treatment couch changed CLD and BALFE 2.6mm and 3.0mm respectively. These results indicate that the effects of setup errors during tangential breast irradiation are most pronounced in the case of patient roll on the treatment couch. A treatment couch top attachment permitting tilt and roll adjustments would be very valuable in correcting for patient setup errors due to roll or tilt before dose delivery.