

AbstractID: 6604 Title: Target localization verification for partial breast irradiation with an EPID in cine mode

**Purpose:** In partial breast irradiation (PBI), even if the target is well defined, and positioned precisely at the beginning of each treatment session, there are no assurances that it will remain so during irradiation. We propose tracking the PBI target using an electronic portal imaging device (EPID) in *cine* mode.

**Method and Materials:** Phantom studies have been conducted using a breast phantom and diode detector. We quantified the dose enhancement to a point on the surface of the contra-lateral breast when the EPID is left extended during treatment. Measurements of the dose enhancement were made for multiple field sizes, beam energies and EPID positions. Additional measurements were made of the dose enhancement to the contra-lateral breast with the medial field included. To preliminarily assess the visibility of targets in the breast, images were taken with a wire fiducial in the field. Additional images were taken with the phantom set in a sinusoidal motion.

**Results:** For a PBI field, the dose enhancement (DE) is 19% for 6 MV and 23% for 10 MV for Source-to-Detector Distance (SDD) = 130 cm, compared to 4% and 4.5%, respectively, for SDD = 155 cm. When the dose to the surface of the contra-lateral breast from the medial field is included in the calculation, the dose enhancement is below 2% for both energies for SDD greater than 142 cm. For a WBI field, DE is below 2% for both energies for SDD greater than 147 cm. In the *cine* EPID images, visualization of the target can be improved with simple image processing techniques

**Conclusions:** The cine EPID technique may be employed safely to monitor WBI and PBI treatments.

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