

AbstractID: 12793 Title: Surface dosimetry for breast radiotherapy treatments

Purpose: To evaluate the impact of beam modifiers and field delivery on surface dosimetry.

Method and Materials: Surface and near surface doses were measured for a range of field setups typically used in breast radiotherapy treatments. Doses were measured using the Attix thin window parallel plate chamber and corrected to the effective point of measurement of this chamber.¹ All measurements were performed on Varian 21EX linear accelerator using 6MV x-rays and doses normalized to the dose at depth of 15 mm which corresponds to d_{max} . Measurements were made for the different beam modifiers and with both static and dynamic fields. The static fields consisted of open beams, fixed wedges and MLC shaped fields. The dynamic fields consisted of Varian EDW fields, square dynamic fields with different MLC leaf gaps (from 4 mm to 2 cm) and complex shaped MLC fields typically used for breast boost fields.

Results: Surface doses for the static and dynamic open field as well as the EDW fields were all of the order of 16%. Surface doses for the square dynamic fields increased very slightly as the fixed MLC gap increased from 4 mm to 4 cm. For the fixed wedges, the surface dose decreased from 14.5 to 11.6% as the wedge angle went from 15 to 60 degrees. The doses at 1 mm depth varied between 38 to 47% in a similar pattern to the surface doses with the minimum dose occurring for the fixed wedges.

Conclusion: In this work, we have shown that surface and near doses for fixed wedge fields are lower compared to dynamically field setups as typically used for breast radiotherapy patients.

Reference: 1. S. Devic *et. al.* "Accurate skin dose measurements using radiochromic film in clinical applications," *Med. Phys.* **33**, 1116-1124 (2006).