

AbstractID: 8269 Title: Experimental determination of correction factors for miniphantoms with different Z for measurement of in-air dosimetry quantities at off-axis points

Purpose: The purpose of this study was to experimentally determine the correction factors for miniphantoms of different Z for off-axis measurements of in-air quantities.

Method and materials: Measurements were performed for two megavoltage photon beams (6x and 15x). Different amount of miniphantom materials were used with radiological buildup depths ranging from 1.8 to 25 g/cm². We used four mini-phantom materials: Lucite, Graphite, Copper and Lead. In-air quantities include: in-air off-axis ratio, in-air wedge factor and output factor.

Results: The mini-phantom material has an effect on the measured in-air dosimetric quantities. The correction factor increases with increasing Z of material, build-up and energy. There is a maximum 1% headscatter correction factor. This error increases with increasing beam energy and increasing Z material. Off-axis ratio correction factor also increases with increasing Z material and with increasing energy. A maximum error of 6% was observed.

Conclusion: We concluded that the mini-phantom material has an effect on the measured in-air dosimetric quantities. The correction factor increases with increasing of Z material, build-up and energy. There is a maximum 1% headscatter correction factor, which is the highest for lead. An off-axis correction factor of up to 6% was determined.