

AbstractID: 11705 Title: Influence of a novel transmission detector on 6 MV X-ray beam characteristics

Purpose: A new 2-D ionisation chamber array from IBA Dosimetry has been investigated at our center for its use as a dosimetric verification tool. This study evaluates the influence of this detector on 6MV X-ray beam properties. **Materials&Methods:** COMPASS is a 2-D transmission array of 1600 plane parallel ionisation chambers with an active area of 40 x 40 cm². The transmission characteristics of the chamber and the influence of the detector on the 6MV X-ray beam parameters in the build-up and beyond were studied. PTW Markus Model 329 chamber was used for measurements in the build-up region and diode was used for relative dosimetry beyond d_{max} . The following relative dose parameters were compared with and without the transmission detector in the path of the beam: central axis PDD; profiles at 1.4 and 10 cm depths; transmission factor at 10 cm. **Results:** For moderately narrow beam geometric conditions (smaller fields, larger SSDs) the increase in surface dose with COMPASS was small. The surface dose profiles also showed expected behavior within the field i.e., increased doses for COMPASS compared to open fields. Beyond d_{max} , the differences between open and COMPASS profiles were negligible. The transmission factors were very consistent throughout the range of field sizes and SSDs investigated. The mean value was 0.967 with a standard deviation of 0.002. Comparison to measurements with an acrylic block tray has shown that the insertion of the transmission detector has a similar effect on the radiation beam as a standard block tray. **Conclusions:** With the exception of the transmission factor, the only other influence of the transmission detector on a 6MV beam is an increase in dose in the buildup region. Our measurements show that the differences between open and COMPASS fields were found to be insignificant beyond d_{max} . Research partially sponsored by IBA Dosimetry.