

AbstractID: 8931 Title: Dosimetric Aspects in the Transmission Factor Determination of a Multileaf Collimator (MLC)

Purpose: Our goal is to investigate the variation in the transmission factor of a multileaf collimator (MLC) for different geometries in order to estimate the error introduced in the dose calculation. **Methods and materials:** In the treatment planning systems (TPS) it is required a transmission factor (TF) for a multileaf collimator. Usually is measured the TF only for the geometry that the TPS manufacturer specifies, and it is considered constant for every field size and depth. We exposed a PTW water phantom and a PTW ionization chamber (0.125cm^3) to 6MV and 18MV X-rays from a Varian Clinac-iX. At constant SSD and for a number of field sizes and depths we scanned the beams perpendicularly to the movement direction of the collimator leaves. In order to assess the influence of the ionization chamber stem we scanned the beams with the chamber oriented parallel and perpendicular to the beam central axis for the reference geometry. **Results:** For the Millenium 120 MLC banks A, B and both banks combined (entwined) we found the transmission values of 1.59, 1.60 and 1.61%, respectively. The difference between the banks A and B was 0.63%. The difference found between the combined array and the mean value of banks A and B was 0.94 %. Using the combined array and placing the ionization chamber parallel to the radiation beam, the transmission measured was 1.59%, resulting in a difference of 1.25 % with respect to the perpendicular orientation. The transmission percentage shows dependence with depth and field size, being more highlight for 6 MV than 18 MV. **Conclusions:** With an ionization chamber, we obtained transmission percentages for a MLC similar to those from film measurements, irrespective of the chamber orientation or combination of leaf banks.