

AbstractID: 1307 Title: Commissioning of an IMRT Independent Monitor Unit Validation Program

Commercial software applications are available for independent verification of IMRT plans. These programs use collimator scatter (S_c) and phantom scatter factors (S_p), PDD/TMR, leaf transmission, and MLC parameters to determine dose at specific points. In this work the different steps involved in commissioning such a commercial software package are discussed. The S_c and S_p were measured in air and water using a 0.015cm^3 pinpoint chamber with a brass buildup cap for square field sizes from 2cm^2 to 40cm^2 . Central axis depth dose and beam profiles were measured with a scanning water phantom dosimetry system. The data were then entered into the commercial software package. To evaluate the accuracy of the program, IMRT fluences were planned by optimizing dose to a 3mm target at d_{max} . The target projection in BEV was square and designed to cover an area equal to 90% isodose in conventional $5\text{cm} \times 5\text{cm}$, $10\text{cm} \times 10\text{cm}$ and $15\text{cm} \times 15\text{cm}$ fields. The plans were optimized to deliver 100 cGy to the target. Doses were computed from d_{max} to a depth of 20 cm throughout the phantom both by TPS and the independent calculation program. Measurements were done at all computed points for respective plans in a solid water phantom using a pinpoint chamber. It was necessary to adjust the dosimetric leaf gap and leaf transmission factor to achieve optimal congruence between calculated and measured doses. Most of the results were between -4% to +2%. The values obtained in clinical plans were also satisfactory with typical variation of $\pm 3\%$ of the total planned dose.