

AbstractID: 11292 Title: Evaluation of Dosimetrical Verification of IMRT Plan Using Mapcheck with Full Phantom Scatter

Purpose: To quantify the dosimetric effect of phantom scatter on the Mapcheck IMRT QA device with and without the inclusion of full phantom scatter (FPS). **Method and Materials:** A sample of 10 sliding window IMRT plans was selected for this study. Treatment sites included CNS, head and neck, lung, and pelvis. Mapcheck was used for the dosimetry verification of these IMRT plans, which were delivered using a Varian 2300IX Linac. To simulate the FPS, water equivalent bolus material (15 cm width and up to 10 cm depth) was placed on and around the Mapcheck. Each QA plan was delivered at SAD 100 to the Mapcheck detector plane at two depths (5cm and 10cm), with and without FPS. The measured and calculated doses with and without FPS were analyzed in absolute mode for TH=5, 3%/3mm DTA criterion within the Mapcheck software. **Results:** At 5 cm depth the total dose (dose sum of all the detectors) with FPS is slightly larger than the one without FPS (average and maximum percent differences are 0.28% and 0.64%, respectively). However, for the 10 cm depth measurements, the total doses with and without FPS are not systematically different (percent difference varies from -0.34% to 0.61% with an average of 0.05%). The relative dose difference with and without FPS for each detector along the y=0 axis shows that the peripheral detectors are more affected by the FPS (maximum percent difference up to 8.2%), while the FPS has negligible effect on the central detectors. Plans with FPS had an average of 1.3% lower passing rate. **Conclusion:** This work indicates that the lack of FPS in the Mapcheck has negligible effect on the dosimetrical verification of IMRT plans.