AbstractID: 10202 Title: Off-Axis Correction Factors for the Enhanced Dynamic Wedge

Purpose: To quantify the dependence of the dosimetric wedge factor for the Varian™ Enhanced Dynamic Wedge (EDW) upon the field size, angle, energy and distance from the machine isocenter. **Method and Materials:** Point dose measurements in solid water and a multi-detector ion chamber array measurements in water were used to measure the x-ray energy deposition from two Varian™ medical accelerators over a wide range of field sizes and distances off the machine isocenter. Measurements at two energies were compared to predictions from two treatment planning programs. **Results:** The variance between the dose predicted by the treatment planning software and that measured for EDW rectangular fields was found to be a smooth function of the distance from the center of the wedged axis. The amplitude of the variance increases with the EDW angle and decreases with increasing energy. The variance was not observed to have any dependence on the distance along the non-wedged axis. A correction factor algorithm was developed which reduced the variance to <1% in all cases. **Conclusion:** The EDW factor is nominally dependent upon the position of the stationary jaw. This work demonstrates an additional correlation between the dose variance and the beam energy, EDW angle, and length of the field along the wedged field axis. The variance increases with increasing EDW angle and decreases with increasing beam energy, becoming as large as ~6% in extreme cases. The width of the field in the unwedged dimension did not have an effect on the variance. A correction factors procedure was able to limit the variance to <1% under all circumstances. For fields centered on the central axis or with one edge on the central axis the variance was already <1% making any additional correction clinically unnecessary.