

AbstractID: 13219 Title: Comparison of Measurements and Eclipse Electron Monte Carlo Calculations for Small Electron Fields with Central Block

Purpose: Dosimetric comparison between measurements and Eclipse electron Monte Carlo calculations for small electron fields with central block, used in ocular lymphoma treatment. **Method and Materials:** Cutout factors for Cerrobend electron blocks with circular apertures of 3, 4 and 5 cm diameters were measured in solid water at d_{max} for 6 and 9 MeV on Varian iX Linac using electron diode and Markus chamber. The dose at d_{max} for the same cutouts with an additional central block (1.2 cm in diameter) was measured in the center of the open area adjacent to central block using the same instruments. The experimental setup was modeled in the Eclipse treatment planning system and the calculated doses were compared with the measured values. Kodak X-OmatV films were used for measurements of relative dose distribution in planes along (axial) and perpendicular (coronal) to central axis at 1 and 2 cm depth. **Results:** Cutout factors measured by diode and Markus chamber agreed well within 1.9% for both energies with and without central block. Eclipse prediction for open cutouts for 9 MeV agrees better than 1% with diode measurements, while for 6 MeV discrepancy is about 3.1 % for 3 cm cutout. However, Eclipse overestimates the dose at d_{max} in case of central block setup by 4.9% and 1.4% for 5 cm cutout for 6 and 9 MeV and by 13.7% and 10.2% for 3 cm cutout, respectively. There is a general disagreement between the film measured and calculated profiles with largest differences observed in the shielded region under the central block and at the deeper depths. **Conclusion:** For small electron cutouts with central blocking, measurements of beam characteristics including output factors and dose distributions are warranted for verification of treatment plans.