

AbstractID: 8420 Title: Measurement of X-ray Contamination from Metallic Filters in Electron Beams

Purpose: To determine whether excessive bremsstrahlung makes metallic compensators clinically unacceptable for missing tissue compensators for electron beam therapy. **Method and Materials:** Depth dose curves were obtained for a 20 MeV beam at 100 cm SSD as a function of filter thickness added to the 15x15 field defining aperture located at 95 cm. Bremsstrahlung was assessed by ionization chamber measurements at a depth of 14 cm (4 cm beyond the open beam extrapolated range). **Results:** Extreme results are as follows: Thin layers of lead created a small increase in x-ray contamination. A thickness of cerrobend adequate to completely block the beam resulted in a 39% decrease in the measured bremsstrahlung. Measurements obtained with copper filters help to better characterize the pattern. **Conclusion:** Bremsstrahlung in a metallic compensator at the location of an electron beam field defining aperture does not significantly add to x-ray contamination in the tail of a high energy electron beam depth dose curve. The use of metallic compensators for electron beam treatments cannot be ruled out on the basis of bremsstrahlung production. Other difficulties in design still need to be resolved and alternatives such as MERT may prove better suited for high workloads.