

AbstractID: 8802 Title: The use of Field Centre Profiles in the matching of linear accelerator photon beams.

**Purpose:** As part of commissioning, parameters such as PDD, output and boundary profiles were used to match four Siemens accelerators, two Primus and two Oncor units. The respective parameters agreed generally to within 1%. However, subsequent dose measurements in dual asymmetric fields on the four units showed a maximum difference of 3-4% between a Primus and an Oncor unit. Further measurements were performed to investigate the potential use of "Field Centre Profiles" (FCPs) in "matching" linear accelerator photon beams. **Methods and Materials:** The Field Centre Profile (FCP) is the ratio of the dose at an off axis point for a given field size to the dose at the axis of collimator rotation for the same field size and depth. FCPs were generated by measuring dose at the geometric centre of a symmetric 10x10 cm field on the central axis in a solid water phantom and on a number of off axis points along a diagonal axis - whilst maintaining the same field size using independent jaws. In addition, the off axis dose measurements were normalised to the central axis dose. FCPs were measured for a range of depths from  $d_{max}$  to 20 cm and to a maximum diagonal distance of 21.2 cm (X, Y=15cm) on all machines. **Results:** (a) FCP values were higher in magnitude (1-2%) compared to the corresponding points on the 40x40 cm diagonal boundary profiles. (b) FCPs from a Primus and an Oncor unit were significantly different, 3-4% maximum, compared to a maximum difference of 2% from a comparison of boundary profiles. **Conclusion:** It is postulated that Field Centre Profiles are more sensitive to flattening filter shape than 40x40 cm boundary profiles. Field Centre Profiles are a potentially useful parameter in matching linear accelerators.