

AbstractID: 12836 Title: Evaluation of some essential dosimetric parameters for beam matching of similar accelerators

**Purpose:** To dosimetrically evaluate beam matching procedure of two similar accelerators using gamma index.

**Method and Materials:** The second accelerator was beam matched with first one using Vendor's acceptance test (ATP) protocol. Depth dose and inline-crossline profiles were matched within  $\pm 1\%$ . In order to quantify the level of agreement between the matched beams we performed a set of measurements including total scatter, collimator scatter, wedge transmission and absolute dose measurement. The ATP specifications are at particular points on the ionization curve for depth dose or profile. Gamma was used to compare planar dose distribution from EDR2 films exposed on both units. For 6MV photon we exposed a film for PDD (10X10cm), beam profile (5,10 and 20cm), a pyramid shape, to compare dosimetric and positional accuracy of MLC a pattern of strips with different MUs at different positions and a diamond shape was exposed. We also exposed a film at tray level to a segmented IMRT field to compare collimator scatter. To account for TPS calculations a film kept in axial plane was exposed to 3DCRT and IMRT plan with actual gantry angles. Absolute dose was measured simultaneously using point chamber.

**Results:** Total scatter, collimator scatter and wedge transmission factors were within  $\pm 1\%$ . The absolute dose for 3DCRT and IMRT plan was within  $\pm 1\%$  of reference value and within  $\pm 3\%$  of TPS value. EDR2 films exposed on both units were analyzed using OmniPro IMRT software. Gamma was calculated for different delta dose and delta distance. The analysis has shown that all these comparisons were in good agreement for delta dose of 2% and delta distance of 2mm.

**Conclusion:** All these tests were done at the commissioning time. We are periodically checking few parameters like PDD, beam profile and MLC accuracy to assure the consistency in beam matching