AbstractID: 1049 Title: Evaluation of Dynamic Phantom for Beam Profile Measurements

The Dynamic phantom, consisting of a 20x12x6 cm^3 scanning Lucite block, has the feature of easy setup for radiotherapy beam profile scans at different gantry angles (Advanced Radiation Measurements Inc.). We performed beam profile measurements for 6/18 MV photons and 6-20 MeV electrons at different field sizes and depths using both the Dynamic phantom and a full size (50x50x40 cm^3) water phantom. The objective of this study is to determine the extent of agreement between measurements by these two phantoms. All data was acquired with a PTW 0.1 cm^3 snake chamber and at 1 mm scanning steps. The measurements were made at 100 cm source to chamber distance for photons and 100 cm source to surface distance for electrons. The chamber depth within the Dynamic phantom was controlled by adding different pieces of Lucite on the phantom surface. The water phantom scans were made at approximately the same water equivalent depths. Our data shows that the whole profile agreement is within 1% within the field border up to 30x30 cm field size and 5 cm depth. The Dynamic phantom, however, may underestimate both the dose outside the field and the 20-80% penumbra for larger field size beams. This study has demonstrated that the Dynamic phantom is very useful for quick dosimetry QA checks of beam symmetry and flatness at different gantry angles.