

AbstractID: 11677 Title: Evaluation of a Planar Ion Chamber Array for Patient Specific IMRT QA

Purpose: To evaluate the IBA MatriXX planar ion chamber array for patient specific IMRT QA by comparing measurements to ion chamber measurement and isodose distribution.

Method and Materials: Ten IMRT plans were delivered to the MatriXX which was placed into the IBA MultiCube virtual water phantom. The dose distribution was compared to the Brainscan treatment planning system (TPS) by using the Omnipro I'mRT software. Ion chamber measurements were also compared to TPS as well as coronal isodose distributions taken with film. A PTW TN31010 cylindrical ion chamber and Kodak EDR were used. Each dosimeter was placed at similar depth in phantom and the composite dose of all treatment fields was used for comparison. The deviation between measured and planned dose was determined for each dosimetry system. Isodose distributions were analyzed with gamma routines meeting a 3%/3mm criteria. The average gamma as well as percentage pixel failure rate were compared.

Results: CAX dose measured on MatriXX differs from plan by an average of 2.8% with a standard deviation of 1.5%. CAX dose measured with the ion chamber differed from plan by an average of 1.8% with a standard deviation of 1.1%. The average gamma for MatriXX dose distribution was 0.59 with standard deviation 0.17. The average gamma for film distribution was 0.64 with a standard deviation of 0.21. The average percentage of pixels that fail gamma was 3.6% for MatriXX and 7.5% for film.

Conclusion: The MatriXX performed as well as or better than ion chamber or film measurements, and the MatriXX provided better agreement to plan than film in nine out of ten cases measured. The results show that the MatriXX is a reliable and consistent device for patient specific IMRT QA.

Conflict of Interest (only if applicable):