

AbstractID: 5713 Title: Commissioning the Eclipse AAA Algorithm with Golden Beam Data

Purpose: Evaluation of the accuracy of Eclipse AAA TPS when commissioned with Golden Beam or measured data

Method and Materials: Two cancer centers independently performed preliminary evaluation of the Analytical Anisotropic Algorithm (AAA) implemented in Eclipse TPS. The AAA photon algorithm was commissioned with vendor supplied "Golden Beam Data"(GBD). We measured central and off-axis profiles in several beam configurations including: open square, rectangular and asymmetric (half-blocked) beam; wedged square and half-blocked beam; square fields at three different source to surface distances; open and wedged beam at oblique incidence; beams shaped using cerrobend blocks and MLC. The measurements were performed on the Varian 2100 EX linear accelerators installed at the two institutions. After the initial tests, Eclipse was recommissioned with measured data from one of the machines.

Results: The evaluation of the profiles was performed in the buildup, penumbra, inner and outer beam regions as per AAPM TG53. With the GBD the agreement of the measured and calculated profiles at the two institutions was very good in all regions except for the inner beam region on one machine. The tests that had a significant number of failures in the inner portion of the beam were mainly those cases where the TG53 tolerances are very tight. In these cases a significant number of points were just beyond the tolerance, and some of the off axis scans had 100% fail. On one particular test case where 16 profiles were measured for a particular geometry, 59% of points passed in the inner section with GBD, while 91% of points in that region passed once the beam was commissioned.

Conclusion: When Eclipse is commissioned with GBD it was quite accurate, however, commissioning with measured data can improve the overall match.

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