

Commissioning of a Flattening Filter Free (FFF) using an Anisotropic Analytical Algorithm (AAA)

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Abstract : Aim: To compare the dosimetric parameters of the flattened and flattening filter free (FFF) beam and to validate the beam data using anisotropic analytical algorithm (AAA). Materials and Methods: All the dosimetric data's (i.e. depth dose profiles, profile curves, output factors, penumbra etc.) required for the beam modeling of AAA were acquired using the Blue Phantom RFA for 6 MV, 6 FFF, 10MV & 10FFF. Progressive resolution Optimizer and Dose Volume Optimizer algorithm for VMAT and IMRT were also configured in the beam model. Beam modeling of the AAA were compared with the measured data sets. Results: Due to the higher and lower energy component in 6FFF and 10 FFF the surface doses are 10 to 15% higher compared to flattened 6 MV and 10 MV beams. FFF beam has a lower mean energy compared to the flattened beam and the beam quality index were 6 MV 0.667, 6FFF 0.629, 10 MV 0.74 and 10 FFF 0.695 respectively. Gamma evaluation with 2% dose and 2 mm distance criteria for the Open Beam, IMRT and VMAT plans were also performed and found a good agreement between the modeled and measured data. Conclusion: We have successfully modeled the AAA algorithm for the flattened and FFF beams and achieved a good agreement with the calculated and measured value.

Keywords : commissioning of a Flattening Filter Free (FFF) ,using an Anisotropic Analytical Algorithm (AAA), flattened beam, parameters

Conference Title : ICBET 2014 : International Conference on Biomedical Engineering and Technology

Conference Location : Melbourne, Australia

Conference Dates : December 11-12, 2014