

AbstractID: 3585 Title: Flattening Filter Free IMRT - First Experimental Results

Purpose:

The purpose of this study is to determine if a flattening filter free clinical accelerator can be used for IMRT applications. Furthermore the performance of a treatment planning system, which has been commissioned for a flattening filter free machine, has been evaluated.

Methods and Materials:

A treatment planning system ECLIPSE (Varian) was commissioned for a 6-MV flattening filter free clinical accelerator, using data resulting from Monte Carlo simulations and measurements. Treatment plans were created for a nasopharyngeal carcinoma case using CT-data of a Rando-phantom, for the filter free machine, and for a standard IMRT machine. A comparison of the treatment plans was performed by evaluating dose-volume-histograms (DVHs). The treatment plans were then delivered to a phantom containing films, and the resulting dose distributions have been compared.

Results:

Comparison of the DVHs from the filter free machine to the standard accelerator revealed better coverage of the PTV, while organs at risk, i.e. brainstem and spinal cord showed decreased dose values, when the filter free machine was used for treatment planning. Comparing the results of film irradiations showed systematically better penumbras and out of field doses in the flattening filter free irradiations, while the target coverage was comparable in both cases.

Conclusion:

The ECLIPSE treatment planning system is capable of creating IMRT plans for a flattening filter free clinical accelerator. Low energy (6-MV) IMRT treatment plans, have successfully been created and delivered to a phantom, showing that advantageous dose distributions can be achieved with a flattening filter free accelerator.

Conflict of Interest:

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