Implementation of a Siemens Virtual Wedge on RenderPlan Planning system

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A Siemens virtual wedge creates a wedged isodose distribution by moving one of the asymmetric jaws across the field during treatment. Any wedge angle is potentially possible with a maximum of about 60 degrees. The virtual wedge output factors are the same as the open field values since no physical wedge is in the beam. To use the virtual wedge clinically, the VW was implemented on our RenderPlan planning computer. RenderPlan uses two types of files to store the wedge data – measured profiles, and correction tables to account for beam hardening. New wedge files were created for the virtual wedges by copying the profiles of the hard wedges at 15, 30, 45, & 60 degrees. No correction files were created resulting in computer generated isodose distributions uncorrected for beam hardening. Any wedge angle could then be generated by combining two wedges and varying the beam weighting.

The RenderPlan generated isodose distributions for various wedge angles were then compared with isodose distributions measured with film in a SW cassette. The Virtual Wedge isodose distributions were obtained with Kodak V-film in a SW film cassette and then scanned in a Scanditronix film scanner with RFA Plus V5.2 software. The film measurements were compared with the RenderPlan generated isodose curves. Good agreement was observed. Problems observed with defining the virtual wedge orientations and limitations will be discussed.