

Virtual Wedge Factors and Clinical Implementation of the Siemens Virtual Wedge

The virtual wedge factor (VWF) for the Siemens virtual wedge (VW) is designed to be approximately 1.00. The purpose of this work is to confirm that statement and to identify conditions in which the VWF is not 1.00 and thus should be included in monitor unit calculations. VWF's have been measured for four x-ray beams as a function of wedge angle, field size, depth and SSD. Our measurements show that the VWF can be as large as 1.052 for a 6MV beam at a depth of 10 cm for a field size of 20×20 cm². We have observed the dependence of VWF on field size and depth, but not on SSD. In contrast to a previous report, we could not confirm the dependence of VWF on calibrations (cGy/MU) for either high or low energy beams. The Siemens VW allows a continuous selection of wedge angles, typically from 15° to 60°. Assuming ±3% criteria for the dose profile of the wedged beam, we have selected a limited number of wedge angles from measured data for clinical use. This limits the commissioning and QA programs for this valued clinical tool. We have not commissioned the physical wedges.