AbstractID: 6807 Title: Commissioning Non-physical Wedges with Film and a Single Ion Chamber

A non-physical wedge generates a spatial wedged dose distribution by moving one of the jaws and varying dose rate at the same time. It has been implemented in both Varian and Siemens accelerators as the Varian Dynamic Wedge and Siemens Virtual Wedge. Wedge profiles are required during the commissioning for treatment planning system and wedge angle verification. Because of its dynamic delivery method, a non-physical wedge is best commissioned using an ion chamber array in a scanning water tank. Such arrays are expensive and not generally available at community cancer clinics. Film provides high spatial resolution, but because of the energy dependence and errors introduced during film processing, film dosimetry is not as accurate as ion chambers. In this work, instead of doing film calibration, we measured each wedged profile with an ion chamber at the point on central axis and 3 to 7 off-axis positions. With this information, each film was individually calibrated, taking account of film-to-film variation in processing. The process was automated with a program written in MatLab. Profiles for 30 and 60 degree non-physical wedges at 18MV and 15 and 45 degree at 6MV from a Siemens Primus were measured in this way at various depths and field sizes and compared to the data measured on the same machine using a detector array. Results agree within 2-3% in the shoulders and 1 mm in the penumbra. This method is an accurate and efficient alternative to commission a nonphysical wedge when a detector array is not available.