

A critical component of patient radiation therapy quality assurance is an independent verification of the treatment monitor unit setting (MU) for each field. With the introduction of complex fluence modulation, traditional manual calculation methods were unsuitable for MU validation, and more time consuming direct dose measurement techniques were adopted. Monitor unit calculators have since been developed reducing the need for phantom based dose measurements. In this work, we present IMRT commissioning results for RadCalc, a commercially available monitor unit calculator. Monitor unit calculations from the Philips ADAC Pinnacle treatment planning system and RadCalc are presented and compared to in phantom measurements for both segment breast IMRT treatments and segment IMRT prostate treatments. It is shown that an agreement between both calculations and measurements to within 2% can be achieved with a judicious placement of dose calculation points. In addition, a simplified extension of traditional PS, CS and TPR calculations is introduced to provide insight into IMRT calculation methods and provides a mechanism to estimate a tolerance based on the uncertainties associated with the dose calculation point placement within each field. Guidelines for optimal calculation point selection are presented, along with site based patient geometry correction factors which can be used to validate IMRT MU calculations within 3% of the treatment planning system value.