

Purpose: Manufacturer recommended rounded leaf offsets for the Philips Pinnacle treatment planning system are inaccurate for leaves away from the central axis, and for varying energies. The need for an in-house MLC rounded leaf offset correction is established, as well as a method for determining the offsets for individual MLC leaves. **Materials and Methods:** A standard picket-fence test is developed with 2 cm separations across a 25x25 field. Dose distributions are calculated for the test, with 20th leaf offset values for the X = 0.0 position ranging from -2.0 to +2.0 mm from the nominal leaf position, using the manufacturer recommended offset curve for leaves 1-40. Dose profiles are collected along the cross-plane of the 20th leaf. The picket-fence test plan is delivered to a film, in phantom at 90cm SSD and 10 cm depth, for 6 and 10 MV energies. Dose profiles are measured through the central axis and superimposed on the calculated profiles produced by the TPS. The profiles are compared for agreement. **Results:** It was found that the measured dose profiles do not match manufacturer recommended offsets for leaves away from the central axis. If the calibrated leaf (20th) is matched to the tabular data, there is deviation in the picket-fence test at distances >5.0 cm from the central axis, resulting in dose discrepancies. Manufacturer-recommended offsets were also observed to be inaccurate for the 10 MV beam, exhibiting an energy-dependence of the required offset values. **Conclusions:** It is found that manufacturer recommended rounded leaf offsets are inaccurate and in-house measurements are required to determine appropriate offsets for groups of leaves near and away from the beam's central axis. It was also found that there is an energy dependence for these offsets. A method for making in-house corrections is established by using measured and calculated dose distributions.