AbstractID: 9749 Title: IMRT Dose Delivery: Cone Beam Compared To Fan Beam

Cone-beam systems, using 2-D areal MLCs, and fan-beam systems, using linear 1-D MLCs, are both in clinical use. The purpose of this work is to compare the IMRT dose delivery capability of cone-beam with fan-beam systems.

There are four key assumptions: CT scanner resolution concepts can be applied equally well to 2-D MLCs and 1-D MLCs; adequate resolution is achieved if the "radial" resolution equals the "angular" resolution; the radial resolution is defined by the 1-D MLC leaf width or the 2-D MLC "window gap" and the radius of the "effective Field of View" (eFOV) is taken as the distance from isocenter to the most distal portion of the PTV.

The 1-D MLCs have a 1cm fixed leaf width. Based on this, the eFOV dia. is 32cm using 51 projections (fields) and 23cm dia. using 36 projections.

The 2-D MLCs have a variable gap between the opposed leaf ends. As an example, this means that fewer than 10 projections can resolve a 3.2cm dia. eFOV with the gap set at 5mm or a 12.7cm dia. eFOV with the gap set at 2cm.

In summary, the fixed leaf width of the 1-D MLCs fixes the dose calculation grid that can be resolved and fixes the diameter of the eFOV. The gap between opposed leaf ends on 2-D MLCs is variable, allowing the delivery resolution to be tailored to the clinical need.

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