

AbstractID: 1495 Title: Eliminating leaf-end abutment while preserving the minimum number of segments and minimum monitor units for segmental IMRT delivery

Leaf end abutment is rarely studied when delivering segmental IMRT fields. We developed an efficient leaf sequencing method to eliminate leaf-end abutment for segmental IMRT delivery. Our method uses simple matrix and sorting operations to obtain a solution that simultaneously minimizes total monitor units and number of segments without leaf end abutment between segments. We implemented and demonstrated our method for twenty treatment cases. We compared the results of our method with the more time-consuming results using exhaustive search method. We found that our solution without leaf-end abutment produce equivalent results as the unconstrained solutions in terms of minimum total monitor units and minimum number of leaf segments. We conclude that the leaf end abutment fields can be completely avoided without affecting the efficiency of segmental IMRT delivery. Our outlined method is simple and fast, which potentially provides a useful method for generating segmental IMRT field that require high spatial resolutions or complex intensity maps.

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