# AbstractID: 11852 Title: Intensity Modulated Arc Treatment Planning Based on Iterative Fluence Optimization and Sliding Window Conversion.

**Purpose:** To develop a robust single rotation intensity modulated arc treatment (IMAT) planning method for VMAT and RapicArc delivery.

**Method and Materials:** This treatment planning method begins by setting a number of equally spaced beams. Their intensity fluences are optimized by a gradient-based optimization algorithm. The fluence maps are then converted to leaf sequences using a sliding window algorithm which enforces machine delivery constraints. Each of these beams is then distributed across different gantry angles, simulating a dynamic arc delivery. New beamlet doses are determined according to the instantaneous gantry and MLC leaf positions. The optimization loops repeats until the optimized beamlet angles are consistent with converted beamlet angles. The new IMAT treatment planning method was demonstrated using a head-and-neck case. The results were compared to a standard IMRT planning method.

**Results:** For the head-and-neck patient, the IMAT treatment planning method achieved a similar treatment plan quality compared to the standard IMRT method. Although the total MU is higher, the IMAT treatment is expect to be faster due to the continuous delivery mode.

**Conclusion:** The new IMAT treatment planning method is robust and guaranteed to be deliverable. It can generate IMAT treatment plans for very complicated cases which could be difficult using existing IMAT planning methods.

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