Docket #: S12-409

Station parameter optimized radiation therapy (SPORT): a novel scheme for treatment planning and delivery in radiation therapy

Stanford researchers have discovered a novel scheme of treatment planning and delivery of radiation therapy, termed station parameter optimized radiation therapy, or SPORT. It achieves highly conformal dose distributions through optimal beam sampling and intensity modulation and at the same time maintains high delivery efficiency.

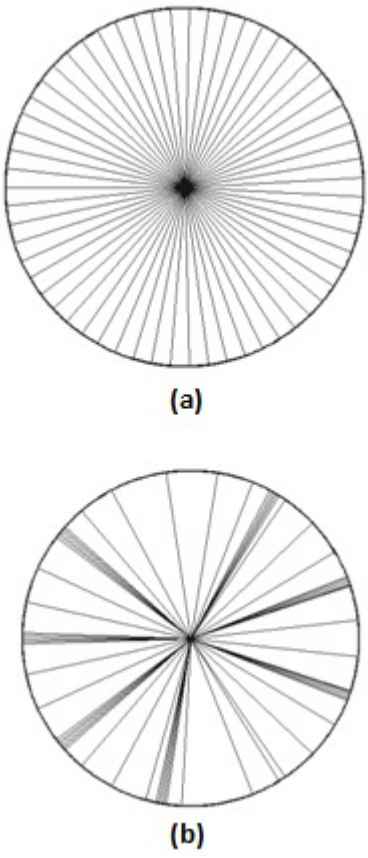


Figure 1. Schematic plot of the beam angular distributions for two treatment

schemes: (a) conventional VMAT and (b) proposed SPORT. The lines indicate the gantry angles of the station points or control points.

Applications

- Treatment planning and delivery techniques in radiation therapy

Advantages

- Can be delivered by commercial medical linear accelerators without modifying existing system hardware
- Achieves optimal dose distributions by non-uniform angular beam sampling, and/or non-isocentric beams, and/or sparse intensity modulation
- Fast delivery by eliminating dispensable intra-beam intensity modulation using novel compressed sensing strategies for dose optimization and planning

Publications

- Ruijiang Li and Lei Xing, "An adaptive planning strategy for station parameter optimized radiation therapy (SPORT): Segmentally boosted VMAT". *Medical Physics Letter*, May 1, 2013.

Patents

- Published Application: 20140330064
- Issued: 9,861,834 (USA)

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