

In an attempt to conformally cover small lesions of complex 3-D geometry, a prototype, post collimation device has been designed and manufactured by NOMOS Corp. It is intended to further restrict the radial dimension (i.e. length) of the elementary beams produced by the Nomos MIMICTM (Multileaf Intensity Modulation Collimator). Currently, the Peacock system's MIMIC delivers elementary beams of approximately 1 cm x 0.8 cm (WxL) or 1 cm x 1.6 cm. The prototype device, known as the BEAKTM, allows the delivery of elementary beams of dimension 1 cm x 0.4 cm. The purpose of this presentation is to evaluate potential improvements in plan quality realized through a BEAK induced reduction in the physical size of the elementary beams used to deliver a Peacock Intensity Modulated Radiation Therapy (IMRT) Treatment. It has been postulated, and preliminary results affirm, that the reduction in radial dimension of the elementary beam leads to an improvement in conformality of the isodose plans. The quality of rival isodose distributions has been evaluated through both visual inspection of isodose conformality, and through ranking of cumulative dose volume histograms.

In recognition of the fact that upon 90 degrees couch rotation the Beak effectively reduces the width of the elementary beams (relative to the patient), treatment plans are being studied which explore the utilization of the Beak along with multiple couch angles. Again, preliminary results indicate a significant improvement in isodose plan quality as evaluated by the aforementioned methods.