THE CORVUS DOSE MODEL REVEALED!, T.W. Holmes*, A. R. Bleier, M. P. Carol, B. H. Curran, J. DeNisi, R. Hill, A. A. Kania, R. J. Lalonde, L. S. Larson, E. S. Sternick, NOMOS Corporation, Sewickley, Pennsylvania

The CORVUS® inverse treatment planning system uses a finite-size pencil beam (FSPB) model for computing dose. The FSPB model is derived from the more general convolution dose formalism based on pencil beam radiation transport kernels. Unlike most convolution formalisms which use datasets generated by Monte Carlo radiation transport codes, the CORVUS FSPB model uses a small set of measured clinical dosimetry data to compute the primary and scatter components of the FSPB kernel. A separate program, CORVUS BEAM UTILITIES (CBU), is used to process the measurements into the FSPB kernel components which are stored as a series of profiles in the Instrument Data File (IDF) for the treatment unit. The profiles are defined for a constant field size (nominally 1cm x 1cm) at the machine isocenter in a fan-line (e.g., parallel-ray) geometry. Patient dose calculations are carried out by means of fast table look-up of the primary and scatter dose components after first transforming the coordinate of the calculation point from the divergent geometry of the patient to the fan-line geometry of the IDF. Dosimetry measurements needed to create the IDF are typically accomplished in one evening of work and creation of the IDF using CBU takes about 30minutes of operator time. Verification measurements indicate agreement within 0.5% for unmodulated beams and 2-4% for highly modulated beams realized by the Varian and Siemens MLCs and the NOMOS MIMiC®. This work was supported by NOMOS Corporation.