

Setting up the conventional treatment plan is facilitated and its quality improved by automation of the search for weights of selected fields. This is achieved by employment of suitable algorithms. Row projection algorithms solve general linear systems and those characteristics make them applicable for the weight optimization problem. The behavior of the particular back projection algorithm and its modification that incorporates integral dose-volume histogram (DVH) constraints is investigated. Its formalism, indifferent to the problem of optimization, should rather be construed as a side-effect of its performance, i.e. if the formulation guarantees its feasibility the algorithm yields solution which fulfills all constraints otherwise it results in the point in the vector space with the shortest distance to constraint sub-spaces. The DVHs are a convenient method for verification and comparison of plans. Since they naturally fall into the abstraction of the row projection algorithms they can be incorporated to affect the result of computation. This permits one to model the disparity between limits of adjacent organs more realistically. Unmodified algorithm deals only with these limits. The latter one, in addition to that, allows one to overdose and/or underdose specific fractions of the volume by the specific fraction of the prescribed dose. The results of algorithm with and without DVH constraints were compared. Both yield acceptable plans yet by allowing the algorithm to know the DVH constraints the optimized weights provide better dosage delivery. Typical prostate cases were investigated and all showed the same trend.