

AbstractID: 2076 Title: Evaluation of heterogeneities correction using Helax and Oncentra treatment planning systems

Corrections for heterogeneities are critical, particularly for small lung fields and fields containy metallic prosthesis. In these cases, it is necessary to know the limitations of the treatment planning system (TPS).

We used a special phantom of solid water manufactured by CIRS to study these limitations on two TPSs currently used in our department (Helax-TMS version 6.1 and Oncentra Treatment Planning (OTP) version 1.2). We can change the phantom configuration and use lung slabs and a plug with a metallic cylinder to simulate lung, prosthesis and bone. Both TPSs have two algorithms: the pencil beam (PB) and collapsed cone convolution (CC). To evaluate our TPS's we use an experimental database with film, ion chambers and a Monte Carlo code (DPM). Different field sizes from 2x2 to 15x15cm², and profiles at different depths were used. The energies of photons were 6 and 15 MV from a Siemens MD2 linear accelerator.

The most accurate result for both algorithms (compared to Monte Carlo and experimental measurements) was the bone case. The largest discrepancy was found for the PB in the lung case for small fields for both energies. The PB was faster in all cases, but the CC gave to us more accurate results in most of all cases studied. Using our benchmark, of Monte Carlo and experimental measurements we present the limitation and perspectives on using TPS's for heterogeneity correction.