AbstractID: 1832 Title: Measurements for Verification of Heterogeneities in 3D and Inverse Planning: A Practical Method

Several papers[1] have been published on heterogeneity correction factors and different types of measurements one has to perform for commissioning a treatment planning system with homogeneous and heterogeneous calculation engines. We developed a method using easily accessible materials to verify calculations and dose distributions generated by two different systems (Adac-Pinnacle[3] and CMS-Xio). The phantom that was constructed for these measurements consisted of four slabs of Plastic Water (1.03 g/cc) with the addition of a block of Styrofoam (7.5 cm thickness), to represent the heterogeneous region. A set of three open fields were used to check the dose calculation to a point and KODAK EDR-2 films were used to obtain planar dose distributions. The results were within 3% in most cases. Next, two IMRT plans used for treatments, were tested on the heterogeneous phantom, a 7fields-Pelvis, generated with Xio and a 6fields-H&N generated with P[3]. Again, the results showed agreement to within 2-3%. This method allows one to establish an efficient verification technique of a 3D and inverse planning system. Details of the method and several clinical examples will be presented.

[1]Boyer A., "Quality Assurance for Treatment Planning Dose Delivery by 3DRTP and IMRT" in General Practice of Radiation Oncology Physics in the 21st Century, AAPM monograph No. 26, ed. by Shiu and Mellemberg, 2000.