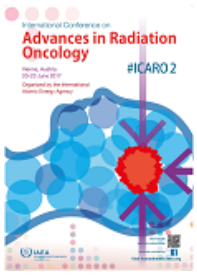

Contribution ID: **300** Type: **Poster**

Dosimetric verification of the small field calculation using Acuros XB dose algorithm for homogeneous and heterogeneous media.

Thursday, June 22, 2017 3:45 PM (5 minutes)

In this study, the comparison of dosimetric accuracy of Acuros XB and AAA algorithms were investigated for small radiation fields incident on homogeneous and heterogeneous geometries.
Small open fields of Varian iX21 linear accelerator on a 6 MV photon beam 1×1, 2×2, 3×3, 4×4 cm2 were used for this study. The fields were incident on homogeneous phantom and phantom containing lung, air, and bone inhomogeneities. Measurements were performed with micodiamond chamber for homogeneous phantom and with EBT3 Gafchromic films for heterogeneous phantoms. Using the same film batch, the net OD to dose calibration curve was obtained using 6 MV energy by delivering 0–800 cGy. Films were scanned 48 h after irradiation using an Epson 1000XL flatbed scanner. The dosimetric accuracy of Acuros XB and AAA algorithms in the presence of the inhomogeneities was compared against measured dose distributions.
Open field tests in a homogeneous phantom showed good agreement between two algorithms and measurement. For Acuros XB, the minimum gamma analysis passing rates between measured and calculated dose distributions were 99.3% and 98.1% for homogeneous and inhomogeneous fields in the case of lung and bone respectively. For AAA, the minimum gamma analysis passing rates were 99.1% and 96.5% for homogeneous and inhomogeneous fields respectively for all used energies and field sizes. In the case of the air heterogeneity, the differences were larger for both calculations algorithms. Overall, when compared to measurement, the AcurosXB had better agreement than AAA.
The Acuros XB calculation algorithm in the Eclipse TPS is an improvement over the existing AAA algorithm. Dose discrepancies were observed for in the presence of air inhomogeneities.

Country

Algeria

Institution

Départment de Physique Médicale et de Radioprotection, Hôpital Chahids Mahmoudi, Tizi Ouzou, Algeria

Primary author: BENCHEIKH, Samir (Départment de Physique Médicale et de Radioprotection, Hôpital Chahids Mahmoudi, Tizi Ouzou, Algeria)

Co-authors: TOUTAOUI, Abdelkader (Départment de Physique Médicale et de Radioprotection, Hôpital Chahids Mahmoudi, Tizi Ouzou, Algeria); METCHAT, Bille (USTHB); BELMESSAOUD, Mourad (Départment de Physique Médicale et de Radioprotection, Hôpital Chahids Mahmoudi, Tizi Ouzou, Algeria); LOUELH, Ryma (Départment de Physique Médicale et de Radioprotection, Hôpital Chahids Mahmoudi, Tizi Ouzou, Algeria)

Presenter: TOUTAOUI, Abdelkader (Départment de Physique Médicale et de Radioprotection, Hôpital Chahids Mahmoudi, Tizi Ouzou, Algeria)

Session Classification: Thursday afternoon - Poster Presentations - Screen5

Track Classification: Dosimetry