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Dose Investigation of CT Based Radiation Therapy Planning System of XIO for Tissue Heterogeneity Corrections with Electron Density Experiments

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Recent most radiotherapy planning system used the CT scan image for dose calculations include the heterogeneity correction in radiation therapy planning system. It means dose acquisition is effected on the electron density of tissue in beam path way provided a correction function of HU-Electron density of CT energy. This experiments study provides the different electron density materials for making the heterogeneity phantom material to compare the Xio generated point doses in the superposition and FFT convolution to that of the measurements. The average uncertainty showed $-1.18 \pm 0.89 \%$, $2.75 \pm 1.04 \%$ for low electron density in superposition and FFT convolution method respectively. Otherwise in high electron density the discrepancy showed $-2.93 \pm 0.83 \%$, $-5.20 \pm 0.64 \%$ in superposition and FFT convolution method. As a results in this experiments showed the dose of heterogeneity correction of XiO generated is very close to the measurements and reliable values in superposition algorithm.

Keywords : Electron Density, Tissue Heterogeneity Correction