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Validation 2-D In-Vivo Dosimetry Based on Correlation Ratio Algorithm

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Verification before and during treatment is very needed in Radiotherapy. 9 out of 17 cases in radiotherapy did not detect any errors during pre-treatment verification but were detected at verification during treatment or real-time measurement, namely In-Vivo Dosimetry (IVD). One of the most massive developments in IVD is using EPID. there are already several algorithms to build it, one algorithm that is considered quite successful is the correlation ratio, but more validation is needed before we used that in daily clinical activities. Because of that, we validate in-several cases using homogeneous phantom, inhomogeneous phantom, and patient simulation with the IMRT technique. We used EPID a-Si 1000, Treatment Planning System (TPS) ECLIPSE 13.6, and Linac Varian Unique photon 6 MV. Every image was taken by continuous acquisition modes. We calculate inline and crossline profile by Full-Width Half Maximum (FWHM), beam symmetry, and beam flatness and also compared the image by Gamma Index 2%/2mm and 3%/3mm. The result shows that correlation ratios need some improvement, the difference resolution between x and y in EPID a-Si 1000 make crossline profile has better match than inline profile. the gamma index shows the algorithm pass greater than 90% in 3%/3mm and less than 90% in 2%/2mm. the algorithm inaccurate in the profile field without the horn section. Further development is needed to make this algorithm can be used in daily clinical activities.

Minioral

Yes

IEEE Member

No

Are you a student?

Yes

Author: Mr RAMADHAN, Muhammad Mahdi (University of Indonesia)

Co-authors: Mr EDY WIBOWO, Wahyu (Department of Radiotherapy, Cipto Mangunkusumo Hospitals and Faculty of Medicine, Universitas Indonesia, Depok, 16424, Indonesia); Dr PAWIRO, Supriyanto Ardjo (University of Indonesia)

Presenter: Mr RAMADHAN, Muhammad Mahdi (University of Indonesia)

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