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VERIFICATION PHANTOMS FOR DYNAMIC RADIOTHERAPY PLANS

Tuesday, 12 July 2022 17:50 (20 minutes)

Currently, verification phantoms for the verification of radiation therapy plans represents a rectangular or cylindrical solid body made of water-equivalent material with a rectangular hole for inserting a matrix detector. The most famous examples are the MULTICube phantom [1], which is a rectangular solid body made of plastic water (water equivalent with an error of ≤ 0.5%), which has several configurations, which allows you to install the MatriXX matrix detector [2] in the phantom body in a position corresponding to the region of interest; ArcCheck phantom [3], which is a cylindrical solid body made of polymethyl methacrylate with a built-in spiral grid of detectors, and having a cavity for inserts made of tissue-equivalent materials; Octavius 4D phantom which is a solid cylindrical body made of polystyrene (water equivalent with an error of ≤ 2%) with a rectangular hole in the center of the cylindrical phantom for inserting a matrix detector.
The analysis showed that a significant drawback of these devices is that their use for the verification of the patient's treatment plan does not give an accurate idea of the absolute dose values in the phantom volume (patient's body), since they use the cross-calibration coefficient and thus neglect a number of quantities that can affect the delivered absorbed dose.
The authors consider it expedient to develop a method for verifying radiation therapy plans, which makes it possible to improve the quality of verification of radiation therapy plans through the use of a cross-calibration coefficient determined taking into account the value of the radiation output of a medical linear accelerator immediately at the time of this procedure.

1. Access mode: http://test.scanditronix-wellhoefer.com/MULTICube.1362.0.html
2. Access mode: https://www.iba-dosimetry.com/product/matrixx-universal-detector-array/
3. Access mode: https://www.sunnuclear.com/products/arccheck

The speaker is a student or young scientist

Section

1. Nuclear technology and methods in medicine, radioecology

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