



Calculation Methods in Radiotherapy Using MATLAB

Hyka Niko^{1,*}, Xhako Dafina², Karaja Theodor², Telhaj Ervis³

¹Medical University of Tirana, Faculty of Medical Technical Sciences, Tirana, Albania; Tirana, Albania;
²University of Tirana, Faculty of Natural Sciences, Department, ³Hygeia Hospital, Department of Radiotherapy of Physics, Tirana, Albania,

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Abstract: Radiotherapy is the use of ionizing radiation to treat cancer. Sophisticated software programs known as treatment planning systems (TPS) are commercially available to tailor-make treatment plans for individual patients. These systems mainly allow clinicians to predict the dose delivered to each voxel in the patient for a given orientation of the radiation beams and other parameters used before actually treating the patients. The best possible plan, which provides the highest therapeutic ratio (highest tumor control with least normal tissue complications), is selected for treatment. There are many tools available for evaluating rival plans in radiotherapy. Most of professional software and methods are commercial and difficult to use by student during practical courses. This article briefly explains the using of some package of Matlab software, (CERR and DREES) for images processing, contouring, modeling and exploring dose response in radiation oncology. In summary, this work provides a powerful, convenient, and common framework which allows students and researchers to use common patient data sets, and compare and share research results.

Keywords: *Radiotherapy, treatment, image processing, radiation beams*

* Corresponding: E-Mail: nikohyka@albamp.org, Tel: ++355682264725, Fax: ++355 4 2257954