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Monte Carlo study of photon dose distributions produced by saturne 43 linear accelerator

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BEAMnrc is a Monte Carlo (MC) code for simulation of photon and electron transport in the radiotherapy field. The purpose of this paper was to develop a technique to derive best estimates for the energy and intensity distribution of the incident electron beam by comparing calculated and measured values for the linear accelerator (linac) Saturne 43 machine. We varied the initial electron energy and full width half maximum (FWHM) of the radius of the electron beam incident on the tungsten target to find the percentage depth dose (PDD), dose profile (DP) curves, the tissue-phantom ratio TPR20/10, the energy fluence distribution and angular distribution for a square field size 10×10 cm². It is found that our results are quantitatively in good agreement with experimental PDD and lateral profile at 10 cm depth. The TPR20/10 agreed well with the literature publisher works. Furthermore, we can reduce the discrepancy between measured and calculated data photon dose distributions to 1.5%/1 mm in the gamma index method for the energy 11.8 MeV and FWHM=0.17 cm. MC simulation of the treatment head of the Saturne 43 machine was successfully done changing the initial properties of electron source in the MC BEAMnrc code.

Biography

A.ZEGHARI has followed his PhD study at the thirty years at the Faculty of Science Rabat/University Med 5 Rabat.. He has participated in many international conference and workshop.

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