

Evaluation of an extrapolation chamber for dosimetry in computed tomography beams using Monte Carlo code (MCNP5)

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The computed tomography (CT) is responsible for the highest dose values to the patients during the exams. Therefore, the radiation doses in this procedure must be accurate. However, there is no primary standard system for this kind of radiation beam yet. A homemade extrapolation ionization chamber was tested for the established of a CT beam primary standard. For calibration laboratories, it is very important that the characteristics of the dosimeters are widely known, as well as the influence that the various components of the extrapolation chamber may present to the energy deposited in its sensitive volume. Different materials for its collecting electrode were also studied for this type of radiation beam. This evaluation was carried out employing the MCNP5 Monte Carlo code. This database and the code were extensively evaluated for the characterization of extrapolation chambers, showing results consistent from the use of other codes. The evaluation of the homemade extrapolation chamber showed the highest influence of 25.31 % for the collecting electrode, and the best material for the collecting electrode for CT radiation beam was graphite.

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