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Basic dosimetry: pathway to solve problems in steep dose radiation fields

Electrons generated by photons during their interaction with matter produce significant ionization through electron-electron Coulomb interactions along their track. The absorbed dose deposited along these tracks is defined as the product of the electron fluence generated and the linear energy transfer, LET, or the restricted mass stopping power averaged over the electron energy spectrum. However, from a standpoint of basic research, in high-ionization density radiation fields, i.e. high LET, where very low-energy electron fluences exist, the physical processes of radiation interaction with matter are not well understood. Besides that, there exists a lack of information about electron cross sections at energy in the sub-keV range and consequently, the determination of the absorbed dose in these radiation fields is challenging. In this talk, I will present some results obtained in the last few years of our research project in basic dosimetry related to steep dose radiation fields and some application in modern radiotherapy. Work partially supported by Royal Society-Newton Advanced Fellowship grant NA150212 and PAPIIT-UNAM grant IN115117.

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