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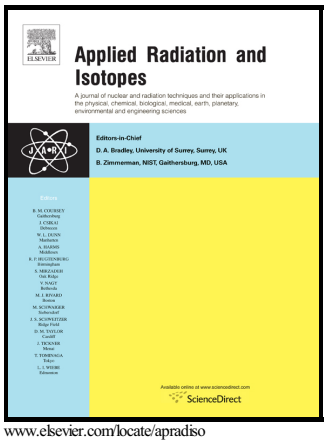

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A study on the optimum fast neutron flux for Boron Neutron Capture Therapy of deep-seated tumors

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Abstract

High-energy neutrons, named fast neutrons which have a number of undesirable biological effects on tissue are a challenging problem in beam designing for Boron Neutron Capture Therapy, BNCT. In spite of this fact, there is not a widely accepted criterion to guide the beam designer to determine the appropriate contribution of fast neutrons in the spectrum. Although a number of researchers have proposed a target value for the ratio of fast neutron flux to epithermal neutron flux, it can be shown that this criterion may not provide the optimum treatment condition.

This simulation study deals with the determination of the optimum contribution of fast neutron flux in the beam for BNCT of deep-seated tumors. Since the dose due to these high-energy neutrons damages shallow tissues, delivered dose to skin is considered as a measure for determining the acceptability of the designed beam. To serve this purpose, various beam shaping assemblies that result in different contribution of fast neutron flux are designed. The

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