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## Therapeutic gain prediction for evaluation and optimization of neutron spectra in BNCT

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In this work, we propose a method for fast evaluation of neutron beam spectrum for the treatment of the brain tumors using boron neutron capture therapy. This method applies an artificial neural network to predict the therapeutic gain which is a very important parameter to evaluate the quality of neutron beam spectra. In this way, we calculated the dose delivered to the tumor region and the maximum dose delivered to healthy tissue, for various neutron beam energy through the Snyder head phantom. The calculations were made using the MCNP Monte Carlo code and the results were used to train the artificial neural network in the learning process. The trained network can be assumed as a function to predict the therapeutic gain of any neutron spectrum. The results of this study indicated that the trained artificial neural network was able to produce the very accurate prediction of the therapeutic gain for any neutron beam spectrum.

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