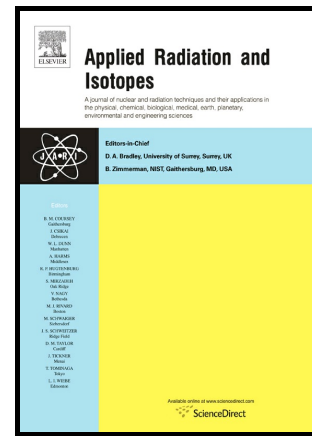


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Neutron Spectrum Unfolding using Radial Basis Function Neural Networks

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Abstract:

Neutron energy spectrum unfolding has been the subject of research for several years. The Bayesian theory, Monte Carlo simulation, and iterative methods are some of the methods that have been used for neutron spectrum unfolding. In this study, the radial basis function (RBF), multilayer perceptron, and artificial neural networks (ANNs) were used for the unfolding of neutron spectrum, and a comparison was made between the networks' results. Both neural network architectures were trained and tested using the same data set for neutron spectrum unfolding from the response of LiI detectors with Eu impurity. Advantages of each ANN method in the unfolding of neutron energy spectrum were investigated, and the performance of the networks was compared. The results obtained showed that RBF neural network can be applied as an effective method for unfolding neutron spectrum, especially when the main target is the neutron dosimetry.

1. Introduction

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