

Computer Code for Materials Diagnosis Using Monte Carlo Method and Neural Networks

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Abstract: Non-destructive testing (NDT) is a highly valuable technique in evaluation and evolution of materials and products. X-ray imaging is an important NDT technique that is used widely in the metal industry in order to control the quality of materials. Sometimes it may be difficult to get a measurement. The simulation of X-ray imaging is often performed using computer codes. This paper presents a new simulation method for materials diagnosis. The simulation is based primarily on the X-ray attenuation law and it is performed using a combination between Monte Carlo method and multi-layer perceptron neural network. The main goal of the proposed method is to obtain more detailed information about the state of the materials.

Keywords: Non-destructive testing, X-ray imaging, Materials diagnosis, Monte Carlo, Neural network

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