

Principles of Modeling-Based Non-Destructive Evaluation of Metal Powders under Microwave Processing¹

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The paper outlines basic principles of a new technique of 3-D microwave imaging for detecting a spherical metal inclusion in a dielectric sample undergoing microwave processing. The developed technique is based on RBF neural network inversion backed by FDTD analysis. Numerical experiments conducted for a two-port waveguide system in the frequency range 2-3 GHz show that the position and size of metal spherical inclusion (of not less than 2 mm) in a powder sample are reconstructed with average errors of 0.2-2.2 %.

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