

# **Discrete inverse transformation for eddy current tomography**

**P. Nowak**,<sup>1</sup> M. Urbański,<sup>1</sup> P. Raback,<sup>2</sup> J. Ruokolainen,<sup>2</sup> M. Kachniarz,<sup>3</sup> and  
R. Szewczyk<sup>1</sup>

<sup>1</sup>*Institute of Metrology and Biomedical Engineering,  
Warsaw University of Technology*

<sup>2</sup>*CSC – IT Center for Science*

<sup>3</sup>*Industrial Research Institute for Automation and Measurements PIAP*

Paper presents results of a discrete inverse tomography transformation on exemplary results from eddy current tomography setup. Eddy current phenomena is highly non-linear and measurement results are ill-posed function of distribution of physical properties of the matter (mostly electrical conductivity and magnetic permeability). Thus the inverse transformation (reconstruction of objects' shape) is based on an optimization algorithm in which objects' model is described as a discrete array. With the usage of Finite Element Method (FEM) tomography measurement process is reconstructed and modelling results are compared with the measurement.