

Design of Magnetic Induction Tomography Setup

Anna Piorun, Paweł Piorun, Paweł Nowak ^{a)}, and Michał Nowicki

*Warsaw University of Technology, Institute of Metrology and Biomedical Engineering,
Boboli 8, 02-525, Warsaw, Poland*

^{a)} Corresponding author: p.nowak@mchtr.pw.edu.pl

Abstract. The paper presents the development of Magnetic Induction Tomography Setup based on eight - coil sensor array which has been designed for further non-destructive research on spatial distribution of electromagnetic parameters of tested elements. The applied method rests on time - varying magnetic field generation from excitation coil, detection of it in sensor coil due to inducted electromotive force and an impact the inserted element exerts upon the measured value by formation of eddy current in examined material. Number of coils used in the system is a trade-off between spatial resolution and complexity which effects on measurement time. The data acquisition system consists of PC computer controlling generation parameters (frequency and amplitude of signal) and acquiring of the measured values (voltage and phase shift in detecting coil) using LabVIEW graphical programming. Along with the computer there is a microcontroller responsible for completing both excitation and detection circuits by a proper pair of coils by manipulating 24 relays.