

Abstract

This master's thesis consists of 60 pages, 24 illustrations, 24 tables, 10 formulas, 10 literary sources.

Keywords: eddy current testing, transformer transducer, digital signal analysis, orthogonality, statistical analysis

In the master's thesis was carried out research of possibilities of creating a method of non-destructive testing using parameters of eddy current's higher odd harmonics up to ninths.

Possible methods of signal analysis were investigated. The orthogonal method of analysis is proposed as primary algorithm. The mathematical model was created and used to investigate dependencies of measurement accuracy from signal parameters. After getting practical data, methods of statistical analysis were used to determine the type of used process.

The study found that orthogonal method of signal analysis demands particular characteristics from signal's structure, which makes system's plan more complicated. Statistical analysis shows that process of measurement has assignable cause, but it is not severe and methods of dealing with it were proposed.

The purpose of the work in the study is to study the feasibility of building a system for the eddy current control using more informational parameters, research of signal analysis methods which can be used in eddy current control and development of math core to use in future devices.

The **object of research** is the process of eddy current diagnostics using higher harmonics

The **subject of research** is the methods of increasing accuracy of phase measurements with digital signal processing

The **scientific novelty** of study is the method of signal analysis which can be used to get informational parameters of higher than usual harmonics.