

ABSTRACT

The master's dissertation contains 82 letters, 25 figures, 23 tables, 18 sources according to the list of references.

Key words: eddy current control, structural elements, aircraft, hodograph, defect dimensions, automation, material degradation, cracks.

The dissertation presents an analysis of structural elements as an object of NC control. The expediency of using eddy current non-destructive testing to detect defects such as surface and subsurface fatigue cracks and evaluate their parameters has been confirmed.

A review of possible methods of processing the received signals according to the available hodographs of the relative applied voltage. Types of overhead and through-flow eddy current converters are considered. The analysis confirmed the feasibility of using an eddy current transducer of the transformer type with differentially connected measuring coils.

During the analysis of hodographs of the applied stress from the defect, the possibilities of a more detailed quantitative assessment of the defect parameters according to the VSP output signal were revealed. The approximate calibration characteristics for the defect parameters obtained from the hodograph of the applied stress from the defect made it possible to trace the peculiarities of the phase and amplitude change of the received GSP signal from the depth and depth of the defect. . The proposed technical solutions make it possible to automate the process of control over the decision on the presence of a defect and the evaluation of numerical indicators of defects.