



# **Health Monitoring of Aircraft Structures Using Piezoelectric Sensors: Integrated piezoceramic sensors for damage detection in aluminum aircraft structural elements**

*Sergey Kuznetsov*

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The number of aging aircraft has increased in the recent years. In this situation new technologies of intensive integrated airframe damage monitoring without the involvement of additional man-hours are highly appreciated. This work represents an experimental research on some rudimentary elements of a potential structural health monitoring system which is based on piezoelectric sensors and exploits guided Lamb waves and electromechanical impedance as physical phenomenon for damage detection in aluminum aircraft thin walled structures. Two experimental research topics are briefly covered: guided Lamb waves feasibility regarding aluminum aircraft fatigue damage detection and electromechanical impedance feature application for piezoelectric sensor local stiffness variation detection, e.g. fatigue crack and joint tightness loss. The work includes some experiments on damage detection in the Mil Mi-8 helicopter tail boom structural elements.

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