IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Specialized Technologies, Including Nanotechnology (8)

Author: Mr. Yuwei Liu
National University of Defense Technology, China, 897405846@qq.com

Dr. Yuqiang Cheng
College of Aerospace and Materials Engineering, National University of Defense Technology, China,
cheng_yuqiang@163.com
Dr. Shuming Yang
National University of Defense Technology, China, yangshuming07@nudt.edu.cn
Prof. Jianjun Wu
College of Aerospace Science and Engineering, National University of Defense Technology, China,
jjwu@nudt.edu.cn

ACOUSTIC FAULT DIAGNOSIS OF ROTOR BEARING SYSTEM

Abstract

Early diagnosis of failures can prevent financial losses and industry downtime. In this article, the author proposes an early fault diagnosis technique for rotor-bearing faults. The proposed technique is based on the recognition of sound signals. The author measured and analyzed the three states of the rotor-bearing system: the rotor-bearing system under normal operating conditions, the rotor-bearing system with faulty bearings, and the rotor-bearing system with rotor friction. In this article, an original feature extraction method is described, namely the 1/3 doubling method (a method of selecting the amplitude of the frequency ratio, a multiple of 30% of the maximum amplitude). This method is used to form feature vectors. A classification of obtained vectors was performed by the KNN (K-Nearest Neighbor Classifier), the SVM (Support Vector Machine) and the decision tree. Early fault diagnosis technology can be used to protect the safe operation of mechanical equipment.