

Study of DC Motor Diagnosis Based on the Vibration Spectrum and Current Analysis

Mariana Iorgulescu*, Robert Beloiu*

* Electrical Engineering Department, University of Pitesti, Pitesti, Romania, iorgulescumariana@mail.com

Abstract— In this paper fault detection of permanent magnet dc motor is described. In past, Current Signature Analysis (CSA) has become an established tool for online fault analysis of AC induction motors. Presently, very little research has been performed using current signature analysis on DC motors. This paper is a brief introduction to fault diagnosis of DC motors using vibration and current signature analysis. In order to do the diagnostics there are analyzed vibration from the piezoelectric accelerometer. The accelerometer is mounted on the frame's motor. Also, for the current measurement it's used ampere sensor. Initially the measurements were realized by using "healthy" DC motor. Then we made successive measurements for the same type of motor with provoked faults. The many faults of DC motors are regarding collectors motor, the commutator short circuit and displaced permanent magnet out of poles in polar axe. We observe significant vibration and also current spectrum differences between "healthy" motors and faulty electrical motor. The spectral analysis of current and vibration provides a method to detect DC motors faults. Using these methods, diagnostic of commutator short circuit and displaced permanent magnet out of poles in polar axe, would be detected even if the motor operated unload.