

## Comparison of Techniques for Detection and Diagnosis of Eccentricity in the Air-Gap Fault in Induction Motors

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**Abstract :** The induction motors are used worldwide in various industries. Several maintenance techniques are applied to increase the operating time and the lifespan of these motors. Among these, the predictive maintenance techniques such as Motor Current Signature Analysis (MCSA), Motor Square Current Signature Analysis (MSCSA), Park's Vector Approach (PVA) and Park's Vector Square Modulus (PVSM) are used to detect and diagnose faults in electric motors, characterized by patterns in the stator current frequency spectrum. In this article, these techniques are applied and compared on a real motor, which has the fault of eccentricity in the air-gap. It was used as a theoretical model of an electric induction motor without fault in order to assist comparison between the stator current frequency spectrum patterns with and without faults. Metrics were purposed and applied to evaluate the sensitivity of each technique fault detection. The results presented here show that the above techniques are suitable for the fault of eccentricity in the air gap, whose comparison between these showed the suitability of each one.

**Keywords :** eccentricity in the air-gap, fault diagnosis, induction motors, predictive maintenance

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