

## New Fault Detection Techniques for Induction Motors

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Double frequency tests are used for evaluating stator windings analyzing the temperature. Likewise, signal injection on induction machines is a well-known technique on sensorless motor control fields to find out the rotor's position. Motor Current Signature Analysis (MCSA) is the most widely used method for identifying faults in Induction Motors. MCSA focuses its efforts on the spectral analysis of stator current.

Motor faults such as broken rotor bars, bearing damage and eccentricity of the rotor axis can be detected. However, the method presents some problems at low speed and low torque, mainly due to the proximity between the frequencies to be detected and the small amplitude of the resulting harmonics respectively. In both cases, the problem of frequency accuracy is very tricky since the sideband harmonic is close to the fundamental harmonic. This paper proposes injecting an additional voltage into the machine under test at a frequency different from the fundamental one, and then studying the resulting harmonics around the new frequencies appearing due to the composition between injected and main frequencies.



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