

## Root Mean Square-Based Method for Fault Diagnosis and Fault Detection and Isolation of Current Fault Sensor in an Induction Machine

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**Abstract :** Nowadays, induction machines are widely used in industry thankful to their advantages comparing to other technologies. Indeed, there is a big demand because of their reliability, robustness and cost. The objective of this paper is to deal with diagnosis, detection and isolation of faults in a three-phase induction machine. Among the faults, Inter-turn short-circuit fault (ITSC), current sensors fault and single-phase open circuit fault are selected to deal with. However, a fault detection method is suggested using residual errors generated by the root mean square (RMS) of phase currents. The application of this method is based on an asymmetric nonlinear model of Induction Machine considering the winding fault of the three axes frame state space. In addition, current sensor redundancy and sensor fault detection and isolation (FDI) are adopted to ensure safety operation of induction machine drive. Finally, a validation is carried out by simulation in healthy and faulty operation modes to show the benefit of the proposed method to detect and to locate with, a high reliability, the three types of faults.

**Keywords :** induction machine, asymmetric nonlinear model, fault diagnosis, inter-turn short-circuit fault, root mean square, current sensor fault, fault detection and isolation

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