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Variation of Inductance in a Switched-Reluctance Motor under Various Rotor Faults

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Abstract : In order to have higher efficiency, performance and reliability the regular monitoring of an electrical motor is required. This article presents a novel view of the air-gap magnetic field analysis of a switched reluctance motor under rotor cracks and rotor tilt along its shaft axis. The fault diagnosis is illustrated on the basis of a 3-D model of the motor using finite element analysis (FEA). The analytical equations of flux linkages have been used to determine the inductance. The results of the 3-D finite element analysis on a 6/4 switched reluctance motor (SRM) shows the variation of mutual inductance with the tilting of the rotor shaft and cracked rotor conditions. These results present useful information regarding the detection of shaft tilting and cracked rotors.

Keywords : switched reluctance motor, finite element analysis, cracked rotor, 3-D modelling of a srm
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