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The Effect of Dynamic Eccentricity on the Stator Current Spectrum of 550 kW Induction Motor

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Abstract : In order to present the effect of the dynamic eccentricity on the stator currents of squirrel cage induction machines, the current spectrums of a 550 kW induction motor was calculated for the cases of full symmetry and dynamic eccentricity. The calculations presented in this paper are based on the Poly-Harmonic Model accounting for static and dynamic eccentricity, stator and rotor slotting, parallel branches as well as cage asymmetry. The calculations were followed by Fourier analysis of the stator currents in steady state operation. The paper presents the stator current spectrums for full symmetry and dynamic eccentricity cases, and demonstrates the harmonics present in each case. The effect of dynamic eccentricity is demonstrating via comparing the current spectrums related to dynamic eccentricity cases with the full symmetry one.

Keywords : current spectrum, dynamic eccentricity, harmonics, Induction machine, slot harmonic zone.
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