Starting transients of three phase reluctance motors as affected by torsional dynamics

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Abstract

In this paper, a rigorous mathematical model describing the transient behavior of three-phase reluctance motors under the effect of torsional dynamics is developed. Provisions are made to allow the analysis of both the three-phase balanced mode of operation and the single-phase mode of operation of such motors. The resulting state-space equations are then solved numerically in order to yield the required transient response curves. The outcome of this study will help in devising techniques to deal with the dangerous consequences of the electromechanical resonance phenomenon that may arise.