

Scope: C3 Machine Design

Combined 3D Numerical and Analytical Computation Approach for Analysis and Design of High Speed Solid Iron Rotor Induction Machines

Mr. Mehran Mirzayee, Prof. Mojtaba Mirsalim, Mr. Houshang Gholizad, Dr. Saeid Javadi arani,
Electrical Engineering Department, Amirkabir University of Technology, 15914, Hafez Ave., Tehran, Iran Email:
mehran_mirzayee@yahoo.com

Abstract

A computationally efficient combined reluctance networks and analytical method suitable for simulating the performance analysis of high speed solid iron rotor induction machines is presented. It is shown that the three dimensional analytical and reluctance networks methods can be coupled for electromagnetic computations in induction machines with solid iron rotor. The analytical method is used in the solid iron rotor region, while the reluctance networks method is applied to obtain the electromagnetic fields in the stator core. In the air-gap, both methods are implemented through the related boundary conditions. The comparison of the simulation results of the proposed method with experimental ones shows the high accuracy of the presented method.