

Computer Aided Engineering Optimization of Synchronous Reluctance Motor and Vibro-Acoustic Analysis for Lift Systems

Authors : Ezio Bassi, Francesco Vercesi, Francesco Benzi

Abstract : The aim of this study is to evaluate the potentiality of synchronous reluctance motors for lift systems by also evaluating the vibroacoustic behaviour of the motor. Two types of synchronous machines are designed, analysed, and compared with an equivalent induction motor, which is the more common solution in such gearbox applications. The machines' performance are further improved with optimization procedures based on multiobjective optimization genetic algorithm (MOGA). The difference between the two synchronous motors consists in the rotor geometry; a symmetric and an asymmetric rotor design were investigated. The evaluation of the vibroacoustic performance has been conducted with a multi-variable model and finite element software taking into account electromagnetic, mechanical, and thermal features of the motor, therefore carrying out a multi-physics analysis of the electrical machine.

Keywords : synchronous reluctance motor, vibro-acoustic, lift systems, genetic algorithm

Conference Title : ICEMT 2021 : International Conference on Electrical Machines and Transformers

Conference Location : Istanbul, Türkiye

Conference Dates : June 28-29, 2021