عنوان مقاله:

Design and Optimization of a Very High Speed Three Phase Bearingless Induction Motor

نویسنده:

Hamed Azadrou - *Azad University, Salmas Branch*

خلاصه مقاله:

This paper explores the application of high-speed bearingless induction motors within compressor systems. These motors utilize two distinct electromagnetic fields to generate both torque and suspension forces, making them suitable for applications requiring high speed with an efficient operation. However, a significant challenge arises from the interference between these fields, which can negatively impact motor performance. To address this issue, we propose a new rotor structure that mitigates the interference problem. The proposed structure is based on the utilization of multiple dual-pole rotors positioned together, each of which is electrically separate from the others. Subsequently, we focus on optimizing the motor's dimensions to enhance both torque generation and suspension force capabilities. To achieve this optimization, a modern genetic algorithm is employed, allowing for comprehensive exploration of the design space. The results of the proposed optimized motor are compared with those of a motor optimized using a conventional algorithm. The findings affirm the effectiveness of our approach in improving motor performance.

کلمات کلیدی:

Bearingless motor, Finite Element Analysis, high speed compressors

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