

## Chaotic Search Optimal Design and Modeling of Permanent Magnet Synchronous Linear Motor

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**Abstract :** This paper presents an electromagnetic finite element model of permanent magnet synchronous linear motor and distortion rate of the air gap flux density waveform is analyzed in detail. By designing the sample space of the parameters, nonlinear regression modeling of the orthogonal experimental design is introduced. We put forward for possible air gap flux density waveform sine electromagnetic scheme. Parameters optimization of the permanent magnet synchronous linear motor is also introduced which is based on chaotic search and adaptation function. Simulation results prove that the pole shifting does not affect the motor back electromotive symmetry based on the structural parameters, it provides a novel way for the optimum design of permanent magnet synchronous linear motor and other engineering.

**Keywords :** permanent magnet synchronous linear motor, finite element analysis, chaotic search, optimization design

**Conference Title :** ICEECE 2016 : International Conference on Electrical Engineering and Computer Engineering

**Conference Location :** Zurich, Switzerland

**Conference Dates :** July 21-22, 2016