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Title

An Indirect Matrix Converter Fed Linear Induction Motor Drive by Considering Time-Varying Parameters.

Authors

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Abstract

An indirect matrix converter fed linear induction motor drive by considering timevarying parameters is presented in this paper. The operation and closed-loop control of the LIM is difficult due to its continuous time-varying parameters such as an air gap flux, end effect, saturation, and iron loss. Hence, the accurate mathematical model is required by considering all these effects. In this paper, the LIM is modeled by splitting the flux and current into two components, and the end and saturation effects are also considered. The indirect vector control of SLIM requires the AC to DC and DC to AC with a large capacitor. This large capacitor creates limitations such as the size of the converter increases, the life of converter decreases, and bidirectional power flow is not possible. These limitations are overcome by using direct AC to AC converter is called a matrix converter. In this paper, the indirect matrix converter is used in the indirect vector control technique in place of AC to DC and DC to AC converter. The indirect matrix converter is controlled with space vector modulation. The transient and steadystate performance of LIM, such as Thrust force, velocity, and matrix converter output voltage, input, and output currents, virtual DC link voltage, and Total Harmonics Distraction of currents are verified through using Matlab. The obtained simulation results are verified by an experimental setup with Dspace DS1104 kit.

Publication

Mathematical Modelling of Engineering Problems, 2020, Vol 7, Issue 3, p483

ISSN

2369-0739

Publication type

Academic Journal

DOI

10.18280/mmep.070320



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