

# Accepted Manuscript

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Imen Kortas, Anis Sakly, Mohamed Faouzi Mimouni

PII: S0360-5442(17)30433-4

DOI: [10.1016/j.energy.2017.03.058](https://doi.org/10.1016/j.energy.2017.03.058)

Reference: EGY 10525

To appear in: *Energy*

Received Date: 28 September 2015

Revised Date: 7 March 2017

Accepted Date: 14 March 2017

Please cite this article as: Kortas I, Sakly A, Mimouni MF, Optimal vector control to a double-star induction motor, *Energy* (2017), doi: 10.1016/j.energy.2017.03.058.

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## Optimal Vector Control To A Double-Star Induction Motor

Imen Kortas, Anis Sakly and Mohamed Faouzi Mimouni

*Research Unit of Industrial Systems Study and Renewable Energy (ESIER)*

*National Engineering School of Monastir (ENIM), Ibn El Jazzar, Skaness,*

*5019, Monastir, University of Monastir, Tunisia.*

[kortas.imen@yahoo.fr](mailto:kortas.imen@yahoo.fr), [sakly\\_anis@yahoo.fr](mailto:sakly_anis@yahoo.fr),

[Mfaouzi.mimouni@enim.rnu.tn](mailto:Mfaouzi.mimouni@enim.rnu.tn)

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### 3 **Abstract**

4 The problem of energy optimization of a Double Star Induction Motor (DSIM) using the  
5 concept of a Rotor Field Oriented Control (RFOC) can be treated by an Optimal Control  
6 Strategy (OCS). Using OCS, a cost-to-go function can be minimized and subjected to the  
7 motor dynamic equations and boundary constraints in order to find rotor flux optimal  
8 trajectories. This cost-to-go function consists of a linear combination of magnetic power,  
9 copper loss, and mechanical power. The Dynamic equations are represented by using a  
10 reduced Blondel Park model of induction motor. From the Euler-Lagrange equation, a  
11 system of nonlinear differential equations is obtained, and analytical solutions of these  
12 equations are achieved so as to obtain a time-varying expression of a minimum-energy rotor

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