“Fault-tolerant control of a multi-phase machine based on multi machine description”

Lille, 13 - 14 November 2006

This form will be used for the program booklet, the Internet URL of the workshop and the CD. Some abstracts are already available on http://l2ep.univ-lille1.fr/iw-mces.htm

Title

“Fault-tolerant control of a multi-phase machine based on multi machine description”
(experimental demonstration session)

Contributors

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Objective

This presentation deals with control in fault operation of a seven-phase Permanent Magnet Synchronous Axial Flux Machine supplied by a seven-leg Voltage Source Inverter (VSI).

Outline

Using a Multi-Machine description, a seven-phase machine which presents a special ability to be controlled with only five phases supplied has been designed. At first the seven-phase vector-controlled drive is presented. The torque and the currents are then examined when one or two phases are opened. In order to reduce the observed torque ripples, a specific control deduced from the Multi-Machine modelling is presented and experimental results on torque show the improvements.
\[ R_{M1}i_{M1} + L_{M1} \frac{di_{M1}}{dt} = v_{M1} - e_{M1} \]
\[ e_{M1} + i_{M1} = T_{M1} \Omega \]
\[ T_{EM} = T_{M1} + T_{M2} + T_{M3} \]

\[ F\Omega + J \frac{d\Omega}{dt} = T_{EM} - T \]

**Experimental set-up**

**References**
