

2019 IEEE Workshop on Electrical Machines Design, Control and Diagnosis (WEMDCD 2019)

**Athens, Greece
22 – 23 April 2019**



**IEEE Catalog Number: CFP1951U-POD
ISBN: 978-1-5386-8108-4**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1951U-POD
ISBN (Print-On-Demand):	978-1-5386-8108-4
ISBN (Online):	978-1-5386-8107-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

DESIGN OF ELECTRICAL MACHINES

A MULTI-CRITERIA DESIGN METHOD OF LINE-START PMSM WITH ENHANCED START-UP CAPABILITY FOR GANTRY CRANE LIFTING SYSTEMS	9
<i>Ioannis D. Chasiotis ; Yannis L. Karnavas ; Stylianos I. Dimadis</i>	
ADDITIVE MANUFACTURING IN CONSTRUCTION OF ELECTRICAL MACHINES – A REVIEW	15
<i>Rafal Wrobel ; Barrie Mecrow</i>	
AN EFFICIENCY ANALYSIS OF A SALIENT POLE AND A FLUX BARRIER SYNCHRONOUS RELUCTANCE MACHINE INCLUDING FLUX WEAKENING	23
<i>Matthias Hofer ; Mario Nikowitz ; Manfred Schrödl</i>	
ASYMMETRICAL FLUX DENSITY DISTRIBUTION IN STATOR TEETH OF SURFACE PERMANENT MAGNET MACHINES	29
<i>Giacomo Sala ; Daniele De Gaetano ; Michele Degano ; Chris Gerada</i>	
CAUSES AND EFFECTS OF GEOMETRIC DEVIATION IN MAGNETIC GEARS	34
<i>A. Leontaritis ; A. Nassehi ; J. Yon</i>	
COMPARISON OF ALTERNATE LSPMSM TOPOLOGIES CONSIDERING BOTH TRANSIENT AND STEADY-STATE OPERATING CHARACTERISTICS	40
<i>Maria S. C. Pechlivanidou ; Antonios G. Kladas</i>	
EDDY CURRENT LOSS CONTROL IN HIGH SPEED PM STARTER-GENERATOR	46
<i>Xiaochen Zhang ; He Zhang ; Chris Gerada ; David Gerada ; Jing Li ; Zeyuan Xu ; Chuan Liu</i>	
MAGNETIC BEARING TECHNOLOGY FOR INDUSTRIAL BEARINGLESS MOTOR SYSTEMS	51
<i>Nicholas R. Hemenway ; Henrik Gjerdal ; Eric L. Severson</i>	
NECESSARY CONDITION FOR DEVELOPMENT OF HIGH EFFICIENCY, HIGH DENSITY AND HIGH SPEED MOTOR	59
<i>Masato Enokizono</i>	
OPERATIONAL ENHANCEMENT OF ELECTRIC DRIVES BY ADVANCED COOLING TECHNOLOGIES	65
<i>Benedikt Groschup ; Martin Nell ; Kay Hameyer</i>	
REDUCED ORDER LUMPED PARAMETER THERMAL NETWORK FOR DUAL THREE-PHASE PERMANENT MAGNET MACHINES	71
<i>P. Giangrande ; V. Madonna ; S. Nuzzo ; C. Spagnolo ; C. Gerada ; M. Galea</i>	
RELIABILITY VS. PERFORMANCES OF ELECTRICAL MACHINES: PARTIAL DISCHARGES ISSUE	77
<i>Vincenzo Madonna ; Paolo Giangrande ; Weiduo Zhao ; Giampaolo Buticchi ; He Zhang ; Chris Gerada ; Michael Galea</i>	
SCALABLE ABC-MODELLING OF PERMANENT MAGNET SYNCHRONOUS MACHINES FOR MODEL ORDER REDUCTION	83
<i>Maria Raluca Raia ; Adrian-Cornel Pop ; Claudia Martis</i>	
STEADY-STATE PERFORMANCE ANALYSIS OF DIRECT-ON-LINE CYLINDRICAL WOUND-ROTOR SYNCHRONOUS MOTOR	89
<i>M. Mabhula ; M. J. Kamper</i>	
TOPOLOGY OPTIMIZATION OF A NONLINEAR ELECTROMAGNETIC ACTUATOR BASED ON A LOCAL IMPORTANCE MEASURE	96
<i>Shabnam Ruzbehi ; Ingo Hahn</i>	

CONTROL OF ELECTRICAL MACHINES

ADAPTIVE PREDICTIVE CONTROL OF INDUCTION MOTORS WITH ON LINE PARAMETER ESTIMATION USING A MODIFIED GENETIC ALGORITHM	103
<i>D. S. Raptis ; A. G. Kladas</i>	
EMULATION OF AN ELECTROMECHANICAL SYSTEM WITH BEARING DYNAMICS	109
<i>John Ch. Dermentzoglou ; Nektarios Galiatsatos</i>	
POSITION CONTROL OF BOOM CRANE VIA DC-DRIVEN GUY LINE	116
<i>Panos C. Papageorgiou ; Antonio T. Alexandridis</i>	

POST -FAULT COMPENSATION CONTROL STRATEGY FOR MULTI-THREE-PHASE PMSM UNDER OPEN-CIRCUIT AND SHORT-CIRCUIT CONDITION	121
<i>Azlia A. Rahman ; A. Galassini ; M. Degano ; H. Abbas ; S. Bozhko</i>	
PREDICTION OF SYSTEM VOLTAGE RECOVERY DUE TO SINGLE PHASE INDUCTION MOTOR STALL USING MACHINE LEARNING TECHNIQUES	128
<i>Soleiman Rahmani ; Afshin Rezaei-Zare</i>	

FAULT DIAGNOSTICS FOR ELECTRICAL MACHINES

DIAGNOSIS OF DEFECTIVE HALL-EFFECT POSITION SENSORS IN BRUSHLESS DC MOTOR DRIVES.....	137
<i>Dimitrios A. Papathanasopoulos ; Epaminondas D. Mitronikas</i>	
DIAGNOSIS OF INCIPIENT BEARING FAULTS USING CONVOLUTIONAL NEURAL NETWORKS.....	143
<i>Arild Bergesen Husebø ; Huynh Van Khang ; Witold Pawlus</i>	
EXPERIMENTALLY VALIDATED MODEL OF A FAST SWITCHED SALIENT POLE ROTOR WINDING	150
<i>R. Felicetti ; C. J. D. Abrahamsson ; U. Lundin</i>	
FINITE ELEMENT 2D AND 3D MODELS OF A ROTOR BAR BREAKAGE IN A SQUIRREL-CAGE INDUCTION MOTOR	157
<i>V. Fireteanu ; A.-I. Constantin ; A. Zorig</i>	
INVESTIGATION OF STATIC ANGULAR AND AXIS MISALIGNMENT IN AN AFPM GENERATOR	163
<i>A. C. Barmpatza ; J. C. Kappatou ; G. A. Skarmoutsos</i>	
MONITORING AND DIAGNOSTICS OF ELECTRICAL MACHINES AND DRIVES: A STATE OF THE ART.....	169
<i>Lucia Frosini</i>	
OPERATIONAL LIMITS OF A LARGE HYDRO GENERATOR WITH BYPASSED COILS AND CIRCUITS.....	177
<i>A. Merkhouf ; S. Bernier ; J. Cave ; O. Kokoko ; J. Pedneault-Desroches ; C. Millet</i>	
STATE OF THE ART ON STRAY FLUX ANALYSIS IN FAULTED ELECTRICAL MACHINES.....	181
<i>G�rard-Andr� Capolino ; Raphael Romary ; Humberto H�nao ; Remus Pusca</i>	

ELECTRICAL MACHINES FOR TRANSPORTATION

AN INNOVATIVE SLOT COOLING FOR INTEGRATED ELECTRIC DRIVES.....	191
<i>Michela Diana ; Jacopo Colussi ; Alessandro La Ganga ; Paolo Guglielmi</i>	
DESIGNING HIGH POWER DENSITY IN-WHEEL PMSM FOR SUSTAINABLE HYBRID ELECTRIC VEHICLES.....	197
<i>Ioannis D. Chasiotis ; Yannis L. Karnavas</i>	
FAULT TOLERANCE IN AN ACTIVE SUSPENSION SYSTEM WITH A LINEAR PERMANENT MAGNET ACTUATOR FOR AUTOMOTIVE APPLICATIONS.....	203
<i>Dimitrios Papagiannis ; Evangelos Tsioumas ; Nikolaos Jabbour ; Markos Koseoglou ; Christos Mademlis</i>	
STUDY ON TEMPERATURE DEPENDENCE OF PARTIAL DISCHARGE IN LOW VOLTAGE TRACTION DRIVES.....	209
<i>F. Pauli ; N. Driendl ; K. Hameyer</i>	
Author Index	