

17th International Symposium on Magnetic Bearings (ISMB17)

Rio de Janeiro, Brazil
18-21 August 2021

ISBN: 978-1-7138-9515-2

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2021) by Department of Electrical Engineering de Universidade Federal do Rio de Janeiro -
Prof. Richard Stephan
All rights reserved.

Printed by Curran Associates, Inc. (2024)

For permission requests, please contact Linz Center of Mechatronics GmbH
at the address below.

Linz Center of Mechatronics GmbH
Altenberger Straße 69
4040 Linz
Osterreich

Phone: +43 732 2468-6002
Fax: +43 732 2468-6005

office@lcm.at

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Switching Stiffness Control of Lateral Motion in Magnetic Suspension System Using Lateral Displacement Detection with Hall Elements	1
<i>Taku Egawa, Takeshi Mizuno, Masaya Takasaki, Yuji Ishino, Daisuke Yamaguchi</i>	
Axial Synchronous Current Suppression of Maglev High Speed Motor Using Adaptive Notch Filter	11
<i>Yue Zhang, Jin Zhou, Xudong Guan, Yuanping Xu, Chaowu Jin, Yingzhe Lin</i>	
Robust Control of Rigid Rotor Active Magnetic Bearing System Based on Signal Compensation	21
<i>Yichen Yao, Yixin Su, Tianye Yu, Honglei Sha, Suyuan Yu</i>	
New Generation High-Temperature Superconducting Maglev Vehicle Developed in Chengdu, China	31
<i>Zigang Deng, Jinkai Zhang, Wen Wang, Yuhang Yuan, Wuyang Lei, Jingzhong Zhao, Zhehao Liu, Minghui Wei, Penghui Zhang, Penghui Wang Xu Zhang, Jun Zheng</i>	
Stability of Electrodynamic Maglev Vehicles Propelled by Permanent-Magnet Linear Electric Motors	32
<i>Salvatore Circosta, Renato Galluzzi Andrea Tonoli, Nicola Amati, Angelo Bonfitto, Torbjorn A. Lembke, Milan Kertesz</i>	
Radial Motion Control of Axial-Flux Self-Bearing Motor Using Plus and Minus Two-Pole Magnetic Fields	46
<i>Satoshi Ueno, Yuki Yamamoto, Changan Jiang</i>	
Modified Excitation Signals for AMB Identification Procedures	58
<i>Diego Diaz, Fernando Pinto, Thiago Ritto, David Maldonado, Vinicius Cortes</i>	
Design Considerations for 2-Level Bearingless Homopolar Motors	73
<i>Tomislav Strinic, Wolfgang Gruber, Fadil Omeragic</i>	
Comparison Between NdFeB and SmCo Permanent Magnets Regarding Eddy Currents in Bearingless PM Synchronous Machines	85
<i>Daniel Dietz, Andreas Binder</i>	
Introduction of a Novel Highly Dynamic Thrust Bearing Control Based on a Fractional-Order Flux Estimator	99
<i>Robert Seifert, Wilfried Hofmann</i>	
Application of Active Disturbance Rejection Control (ADRC) in the Radial Position Control of a Bearingless Induction Machine with Split Winding	102
<i>Werbet L. A. Silva, Elmer R. L. Villarreal, Jossana M. S. Ferreira, Jose A. Paiva Andres O. Salazar, Andre L. Maitelli</i>	
Influence of Magnetic Eccentricity in Bearingless PM Synchronous Machines	115
<i>Daniel Dietz, Andreas Binder</i>	
Identification of Various Frequency Response Functions for Levitating Rotor System Using Active Magnetic Bearings	127
<i>Michael Kreutz, Johannes Maierhofer, Thomas Thuemmel, Daniel J. Rixen</i>	
Summary of a Bearingless Motor with Passive Electrodynamic Axial Suspension	139
<i>Guilherme Cavalcante Rubio, Yusuke Fujii, Akira Chiba</i>	

Proposal of Surface-Rotating Ball for Wind-Tunnel Using Magnetic Suspension.....	142
<i>Takeshi Mizuno, Yonosuke Jibiki, Yuji Ishino, Masaya Takasaki</i>	
Optimization of the Guiding Stability of a Horizontal Axis HTS ZFC Radial Levitation Bearing	150
<i>Antonio J. Arsenio, F. Ferreira Da Silva, Joao F. P. Fernandes, P. J. Costa Branco</i>	
Investigations on a New Slotless Homopolar Hybrid Active Magnetic Bearing.....	167
<i>Guillaume Colinet, Bruno Dehez</i>	
Space Vector Modulation for High Dynamic Current Control of a Self-Sensing Active Magnetic Bearing	182
<i>Dominik Wimmer, Markus Hutterer, Manfred Schroedl</i>	
Building a Bench with Magnetic Bearings for Study of Rotor Dynamics.....	197
<i>Jefferson S. Coelho, Fernando Augusto N. C. Pinto</i>	
Dynamics of Vertical Magnetic Suspension Rotor and Touchdown Bearing: Touchdown Mechanism	210
<i>Zilin Li, Congtao Wang, Zixi Wang, Yuming Wang</i>	
A Novel Inductive Sensor Input Circuit with Improved Tolerance to Non-Concentricity with Touch-Down Bearings	222
<i>Richard Jayawant Andrea Masala, Roy Leung, Nigel Davies</i>	
Design and Comparison of Dual-Purpose Stator Windings for Active Chatter Suppression in Milling Spindles	237
<i>Dennis Guhl, Robin Liebfried, Wilfried Hofmann</i>	
Operating a MagLev Train Prototype with Supercapacitors and Charge by Opportunity	252
<i>Gabriel R. Pereira, Richard M. Stephan, Felipe Costa</i>	
Monitoring of Active Magnetic Bearings	265
<i>Bert-Uwe Köhler, Matthias Lang, Kristin Krenek</i>	
Approaches to Efficiency and Life Cycle Assessment of Magnetic Bearing Systems	274
<i>Hubert Mitterhofer, Stefan Fragner</i>	
Dynamic Suspension Performance of an Ultra Compact 5 DOF Controlled Axial Gap Type Self Bearing Motor for Use in Pediatric Ventricular Assist Devices.....	288
<i>Masahiro Osa, Toru Masuzawa, Toshihiro Yamashita, Eisuke Tatsumi</i>	
Hybrid Active-Passive Operation of a Passively Levitated Self-Bearing Machine.....	295
<i>Joachim Van Verdegheem, Eric L. Severson, Bruno Dehez</i>	
Random Vibration Simulation and Testing of a Compact, Magnetic Bearing Supported Blower for Space Applications	298
<i>Larry Hawkins, Rasish Khatri, Alexei Filatov, Chris Dellacorte, S. Adam Howard</i>	
Bearingless Induction Motor Design with the DPNV Winding and Reduced Axial Length Pole-Specific Rotor.....	312
<i>Jiahao Chen, Eric L Severson</i>	
A Hall Sensor Based Position Measurement Hybrid Magnetic Levitation System	327
<i>Xing-Dong Fu, Guang-Zhong Cao, Li-Jia Wang, Su-Dan Huang, Jian Zhou, Xiao-Sheng Yang</i>	
Identification of Cracks in Shafts Using Magnetic Bearings.....	335
<i>Cesar Augusto Fonseca, Michael Kreutz, Thomas Thuemmel</i>	

Model and Control of a Six-Pole Magnetic Bearing	345
<i>Laura Julia Martins Mothe, Vinicius Ramos Vasco, Yago Pessanha Correa, Domingos De Farias Brito David, Afonso Celso Del Nero Gomes</i>	
Criticality of Rare Earths for Application in Electric Vehicles and Wind Energy in Brazil	357
<i>Sergio Eduardo Meirelles De Paula Junior, Mariana Figueredo Jacques De Souza, Cristiano Nunes Da Silva, Dejair De Pontes Souza, Virgilio Jose Martins Ferreira Filho</i>	
Summary of Machine Design and Current Regulation for the Parallel DPNV Bearingless Motor Winding	367
<i>Nathan Petersen, Anvar Khamitov, Timothy Slininger, Eric L. Severson</i>	
Comparative Study of an Optimal Control Scheme in Different Magnetic Bearings' Geometries.....	372
<i>Yago Pessanha Correa, Laura Julia Martins Mothe, Vinicius Ramos Vasco, Domingos De Farias Brito David, Afonso Celso Del Nero Gomes</i>	
Development of Magnetically Levitated Motor Driven at Extremely Low Temperature.....	387
<i>Mochimitsu Komori, Hirohisa Kato, Ken-Ichi Asami, Nobuo Sakai</i>	
Linear Observers Design for a Three-Pole Magnetic Bearing.....	393
<i>Vinicius Ramos Vasco, Yago Pessanha Correa, Laura Julia Martins Mothe, Domingos De Farias Brito David, Afonso Celso Del Nero Gomes</i>	
Review About Control and Estimation Strategies Applied to Bearingless Machines.....	403
<i>Jose A. De Paiva, Werbet L. A. Da Silva, Jossana M. D. S. Ferreira, Andre L. Maitelli, Andres O. Salazar, Elmer R. L. Villarreal</i>	

Author Index