The International Maglev Board (editor)

# Maglev Solutions for People, Cities, and Regions?

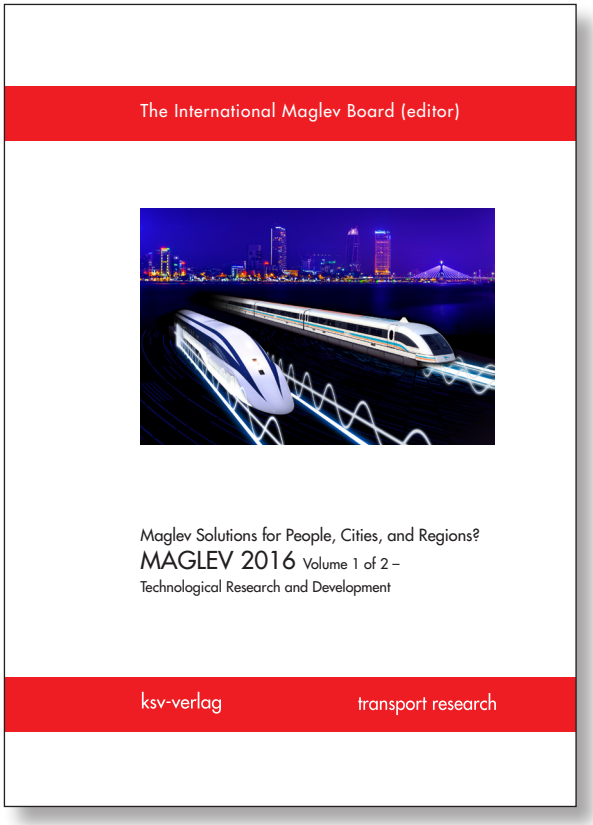
# MAGLEV 2016 Volume 1 of 2 –

## Technological Research and Development

ksv-verlag

transport research

Herstellung und Verlag: ksv kölner stadt- und verkehrs-verlag
www.ksv-verlag.de
ISBN 9 783940 685285
Umschlag: Kenji Eiler
Zusammenstellung für Druck
mr-productions – die agentur · Friedrichstraße 32, 50321 Brühl, www.mr-productions.de




# Maglev 2016

Welcome message from Prof. Dr. Hiroyuki Ohsaki (University of Tokyo, Japan)

On behalf of the International Steering Committee, I sincerely welcome you to the Maglev 2016 conference in Berlin, Germany. Since the first Maglev conference in Boston, USA in 1977, the 22 Maglev conferences were held in North and South America, Asia and Europe. In the 21st century the conferences were held in Switzerland, China, Germany, USA, Korea, and Brazil. This is the 23rd Maglev conference and the fifth conference held in Germany, which has contributed significantly to the progress of maglev technology.

The Maglev conference will provide a unique opportunity for engineers, researchers, and those involved in railway industry, transportation planning and urban design to meet and exchange the latest information on maglev and linear drive technologies. With fruitful exchange of the information, I believe the conference could contribute a lot to improvement of operational characteristics and practical realization of new systems.

The Maglev 2016 conference will be held in Berlin in cooperation with InnoTrans 2016. I would be very happy to have you enjoy the conference, the rail industry event, and the stay in Berlin.

Chair, International Steering Committee of Maglev 2016 conference
Hiroyuki Ohsaki

# Content

Page

**Foreword**

**Content**

**1. The stator winding with the inclined rounds. Possible applications** 9
*Sundukov Evgeny*

**2. Saving Money with Maglev. An Urban Transport Revolution** 15
*Maurizio Cavagnaro, Vincenzo Delle*

**3. A multidimensonal Examination of Prefomences of the Future advanced Transport Systems: The ETT (Evacuated Tube Transport) TRM (Transrapid MAGLEV) System** 25
*Milan Janić*

**4. Experimental Study on Bending Vibration Evaluation in a Test Stand for Maglev Vehicles** 46
*Masashi Kabutomori, Toshiaki Murai, Hiroshi Yoshioka, Yoshiaki Terumichi*

**5. Research on the influence of track irregularities on the levitation control system of a traveling maglev train** 53
*Danfeng Zhou, Peichang Yu, Peng Cui, Jie Li*

**6. Information fusion-based speed and positioning approach in low-speed maglev train system** 62
*Pan Hongliang, Fang Yungen, Tu Jiliang, Cu Weiqi*

**7. Study on the Optimal Slip Frequency Control of Maglev Linear Induction Motor** 74
*Xijun Liu, Kunlun Zhang, Wenlong Zhang,Yin Chen*

**8. Invent of Manufacturing Maglev Guidance and Maglev Guidance** 79
*Seppo Hauta-aho*

**9. Medium Speed Urban/Intercity Maglev Development** 87
*James G. Wieler, D. Bruce Montgomery, Binson Du*
*Magplane Technology Inc./Shanghai Maglev Transtech Ltd.*

**10. Effect of extreme operation conditions on a new type of mid-low speed maglev vehicle** 99
*Miao Li, Ruiming Zou, Weihua Ma*

**11. Implementation Analysis of Maintenance Management System for Maglev Guideway System** 110
*Cui Weiqi, Chen Jinliang, Huang Jingyu, Pan Hongliang*

**12. Research on influence of anti-roll beam structure on the line adaptive capacity of low-speed maglev train** 119
*Jun Zhao, Weihua Ma*

**13. Numerical Analisys of UAQ4 maglev bogie dynamic suspension at stanstill** 126
*D'Ovidio Gino, Carpenito Alessandro*

**14. Fundamental Study on Effect of Gap Reduction on EDS and LSM Characteristics of Superconducting Maglev Vehicles** 134
*Takenori Yonezu, Ken Watanabe, Erimitsu Suzuki*

**15. Preliminary Design of the Magplane MagTrain System** 152
*Jiarong Fang, D. Bruce Montgomery, Stephen J. Kochan*
*Magplane Technology, Inc.*

**16. The application research on lithium ion battery used on low speed maglev train** 162

*Zhiming Liao, Guobin Lin, Peng Han*

**17. Research on A New Type of Medium-low Speed Maglev train Negotiating Curve of 50m Radius** 170
*Junxiong HU, Weihua Ma*

**18. Development of A Novel Inductive Power Transfer System for Maglev Vehicle** 179
*Liming Shi, Yaohua Li, Qiongxuan Ge, Manyi Fan*
*Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering Chinese Academy of Sciences; University of Chinese Academy of Sciences, Beijing, China*

**19. The Response of High Speed Maglev Line under Horizontal Earthquake** 185
*Jingyu Huang, Fujie Jiang, Xiankai Liu, Yang Gao, Qiang Cao, Peng Wang, Yansheng Zhang*

**20. Study on the Standardization of Changsha Urban Maglev Project** 189
*Peiliang Yan, Xiao Liang, Guoxin Sun*

**21. Static Suspension Device Used in Permanent Magnet Electrodynamic Suspension Vehicle** 196
*Wenlong Zhang, Kunlun Zhang, Xijun Liu, Yin Chen*

**22. Arduino Microcontroller Implementation of magnetic levitation system With Simulink Autocode Generator** 201
*Mundher Yaseen, Vedat Mehmet Karsli*

**23. Practice of Alignment Maintenance for Shanghai Maglev Demonstration Line** 209
*Zhiwei Zhu, Feng Ye, Yihong Yuan, Liangshuan Diao, Yueting Wang, Yimin Zhu*

**24. Design of Guideway Switch in Changsha Medium and Low-speed Maglev Project** 215
*Guofeng Zeng, Yihong Yuan, Wen Jl, Feng Ye, Guoqiang Wang*

**25. Fabrication of a Real-scale Superconducting Coil Using REBCO Coated Conductor for the Maglev** 224
*Katsutoshi Mizuno, Motohiko Sugino, Minoru Tanaka, Masafumi Ogata, Tetsuji Okamura*

**26. Development of flywheel energy storage system using magnetic bearing composed of HTS coils and bulks** 231
*Y. Miyazaki, M. Ogata, T. Yamashita, K. Nagashima, T. Maeda, T. Matsuoka, K. Nakao, H. Shimizu, S. Horiuchi*
*Railway Technical Research Institute, Kubotek Corporation, Furukawa Electric Co.,Ltd, Mirapro Co.,Ltd, Public Enterprise Bureau of Yamanashi Prefecture*

**27. Hardware Design for the Track Inspection System** 237
*Yihong Yuan, Yanyun Luo, Feng Ye, Guofeng Zeng, Zhiwei Zhu, Guoqiang Wang, Sheng Bi*

**28. Safety Assessment Approach for Onboard ATP System of Changsha Low-speed Maglev Project** 244
*Yungen Fang, Xiaoqing Zeng, Cheng Zhang*

**29. The multiple modulation strategies of high power converters for high speed maglev traction system** 246
*Xiaomei Lv, Yaohua Li , Qiongxuan Ge, Liming Shi*
*Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering, Chinese Academy of Sciences*

**30. Application of New Integrated Girder In Shanghai Maglev Line** 263
*Feng Ye, Guofeng Zeng, Yihong Yuan, Guoqiang Wang, Qing Lv, Yimin Zhu, Zhiwei Zhu*

**31. Development of a Dual Levitation Controller of Maglev Train** 270
*Chang-Hyun Kim, Bong-Seup Kim, Dong-Sung Kim, Hyung-Suk Han*

**32. Development of High Accuracy Magnetic Levitation Transport System for OLED Evaporation Process** 274
*Chang-Wan Ha, Chang-Hyun Kim, Jaewon Lim, Jong-Min Lee, Doh-Young Park*
*Department of Magnetic Levitation and Linear Drive,*
*Korea Institute of Machinery & Material (KIMM)*

**33. Development of automated procedures for simulation based propulsion**

**rating of high speed maglev** 280
*Dipl.-Ing. Sven Körner*

**34. Study on the Gap Holding Mechanisms of Eddy-Current Rail Brakes by Attractive Force Control** 301
*YODA, Hiroshi, Yasuaki Sakamoto*

**35. Slide Performance of Magnetic Flux Distribution on Cylinder PM Type Linear Halbach Array** 316
*Kanamaru Masatoshi, Tokunaga Shogo, Kainuma Shuichiro, Sato Mizuki, Ito Atsushi, Suzuki Haruhiko*

**36. Observation of magnetic field distribution related to multidimensional motion utilizing a novel layered cylinder-shaped permanent magnet type linear Halbach array** 319
*Haruhiko Suzuki, Masatoshi Kanamaru, Tokunaga Shogo, Kainuma Shuichiro, Sato Mizuki, Ito Atsushi,*

# kölner stadt- und verkehrs-verlag

## Bestellung

Fax: 0 22 32 / 950 - 726

| | | Anzahl der Exemplare |
|---|---|---|
| | **Verlagsreihe Verkehrspraxis** | |
| 01 | CarSharing in Deutschland - von den Anfängen bis heute – Bundesverband CarSharing e.V. (Hrsg.)<br>ISBN 9 783940 685155 – Euro 34,00 | |
| 02 | Eine Idee setzt sich durch! 25 Jahre CarSharing – Bundesverband CarSharing e.V. (Hrsg.)<br>ISBN 9 783940 685193 – Euro 29,00 | |
| 03 | CarSharing und ÖPNV – Entlastungspotenziale durch vernetzte Angebote – W. Loose, M. Glotz-Richter (Hrsg.)<br>ISBN 9 783940 685186 – Euro 34,00 | |
| 04 | Mobilität in Osnabrück – Herleitung und Entwicklung eines Mobilitätskonzepts aus Sicht von econnect Osnabrück – unter besonderer Berücksichtigung der Elektromobilität – Stadtwerke Osnabrück / RWTH Aachen (Hrsg.) ISBN 9 783940 685261 – Euro 29,00 | |
| 05 | Liegt die Zukunft der Elektromobilität im ländlichen Raum?! – Thomas J. Mager (Hrsg.)<br>ISBN 9 783940 685841 – Euro 34,00 | |
| 06 | Zukunftschancen der Elektromobilität – Thomas J. Mager (Hrsg.)<br>ISBN 9 783940 685223 – Euro 29,00 | |
| 07 | ÖPNV in Klein- und Mittelstädten – Perspektiven für einen wirtschaftlichen ÖPNV?! –<br>Thomas J. Mager (Hrsg.) ISBN 9 783940 685964 – Euro 29,00 | |
| 08 | Urbane Seilbahnen – Moderne Seilbahnsysteme eröffnen neue Wege für die Mobilität in unseren Städten –<br>H. Monheim, Ch. Muschwitz,W. Auer, M. Philippi ISBN 9 783940 685988 – 39,00 Euro | |
| | **Verlagsreihe Verkehrsforschung** | |
| 09 | Maglev Solutions for People, Cities, and Regions? MAGLEV 2016 Volume 1 of 2 – Technological Research and Development –<br>The International Maglev Board (editor) ISBN 9 783940 685285 – Euro 49,00 | |
| 10 | Maglev Solutions for People, Cities, and Regions? MAGLEV 2016 Volume 2 of 2 – Maglev Projects, Implementations and Impacts<br>The International Maglev Board (editor) ISBN 9 783940 685285 – Euro 39,00 | |
| 11 | Fahrradverleihsysteme in Deutschland – Relevanz, Potenziale und Zukunft öffentlicher Leihfahrräder –<br>H. Monheim, Chr. Muschwitz, Joh. Reimann, M. Streng ISBN 9 783940 685933 – Euro 39,00 | |
| | **Verlagsreihe Stadt- und Regionalforschung** | |
| 12 | Beispiele der Stadt- und Regionalentwicklung II – Thomas J. Mager ISBN 9 783940 685957 – Euro 29,00 | |
| | **Restexemplare** | |
| 13 | Renaissance der Straßenbahn – Jürgen Burmeister ISBN 9 783940 685209 – Euro 19,00 | |
| 14 | Nachhaltige Mobilität – vom Mobilitätsmanagement bis zur Elektromobilität –<br>Thomas J. Mager (Hrsg.) ISBN 9 783940 685087 – 19,00 Euro | |
| 15 | Mobilitätsmanagement – Thomas J. Mager (Hrsg.)<br>ISBN 9 783940 685940 – 19,00 Euro | |
| 16 | Neue Finanzierungsinstrumente für die ÖPNV-Infrastruktur (deutsch/englisch) –<br>Oliver Mietzsch ISBN 9 783940 685995 – 19,00 Euro | |
| 17 | „Quo Vadis Privatisierung?!“ Rekommunalisierung kommunaler Leistungen – Königsweg oder Sackgasse?! –<br>Thomas J. Mager (Hrsg.) ISBN 9 783940 685087 – 19,00 Euro | |

Alle Preise enthalten die gesetzlichen MwSt., zzgl. Versand

Institution / Firma

Name

Vorname

Straße / Hausnummer

PLZ / Ort

Telefon

E.Mail

internationale USt-Identifikationsnummer (nur bei Bestellungen aus dem Ausland)

Datum / Unterschrift

kölner stadt- und verkehrs-verlag
Hansaring 61 · D-50670 Köln · info@ksv-verlag.de · www.ksv-verlag.de

ksv-verlag
kölner stadt- und verkehrs-verlag

kölner stadt- und verkehrs-verlag
Hansaring 61 · D-50670 Köln · info@ksv-verlag.de · www.ksv-verlag.de