

Program at a Glance

Date	Time	Largo Hall (Oral Session)		Villa Olympica (Poster Session)	
		A	B		
May 31	18:00	Registration			
Wed	19:00	Welcome Party			
June 1	9:00	Opening Addresses			
	9:30	Keynote Speeches			
	10:50	KN-1, KN-2			
	11:00	Survey Lectures			
	12:00	SL-1, SL-2			
	12:00	Lunch			
	13:00			TR-8-12, ML-6-12 FA-8-16, MC-5-8 NA-9-15, AC-11-14	
	Thu. 14:50				
	15:00	Transportation - I	Motor Control - I		
	16:20	TR-1- TR-4	MC-1-4		
16:30	Transportation - II	Numerical Analysis - I			
17:30	TR-5 -7	NA-1 -3			
19:00	Banquet				
June 2	9:00	Magnetic Levitation - I	Numerical Analysis - II		
	10:40	ML-1 -5	NA-4 -8		
	10:55	Factory Automation - I	Actuators - I		
	12:15	FA-1 -4	AC-1 -4		
	12:15	Lunch			
	13:15			TR-13-19, ML-13-17 FA-17-23, MC-9-12 NA-16-23, AC-15 -20 RT-4	
	Fri. 15:15				
	15:30	Factory Automation - II	Actuators - II		
	16:30	FA-5 -7	AC-5 -7		
	16:45	Related Topics - I	Actuators - III		
17:45	RT-1 -3	AC-8 -10			
17:50	Closing Address				

FINAL PROGRAM



First International Symposium on

Linear Drives for Industry Applications

**LDIA'95
NAGASAKI**

31 May - 2 June, 1995
Ioujima, Nagasaki, Japan

Sponsored by:

The Institute of Electrical Engineers of Japan

Co-sponsored by:

Nagasaki University

In cooperation with:

The Japan Society of Mechanical Engineers
The Japan Society of Applied Electromagnetics and Mechanics
The Japan Society for Precision Engineering
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Conference Information

LDIA '95 Secretariat:

Prof. Ebihara D. and Dr. Torii S.,
 Dept. of Electrical and Electronic Eng., Musashi Institute of Technology,
 1-28-1, Tamazutsumi, Setagaya, Tokyo 158, JAPAN
 Phone: +81-3-3703-3111 (ext. 2764), Telefax: +81-3-5707-2212,
 e-mail: torii@eml.ee.musashi-tech.ac.jp

Conference Date and Site

Date: 31. May, 1. and 2. June 1995
 Site: Renaissance Nagasaki Ioujima,
 Hotel reception: Phone +81-958-98-2331, Telefax +81-958-98-2233

Registration

Wednesday, 31. May, 18:00-20:00 Largo Hall
 Thursday, 01. June, 08:30-17:00 Largo Hall
 Friday, 02. June, 08:30-13:00 Largo Hall

General registration fee is 40,000 yens, including proceedings and banquet.

Official Language

The official language of the conference is English.

Technical Visit

Mitsubishi Heavy Industries, Ltd.; Nagasaki Shipyard & Machinery Works and Nagasaki Research & Development Center. The bus starts from JR Nagasaki Station at 13:00 and returns Oohato Pier Port Terminal at 17:15 on May 31 (Wed). Visit one of the largest Shipyard in the world and its Seakeeping & Maneuvering Basin. Then take a short cruise from Koyagi to Nagasaki. Visit one of the greatest Turbine Shop in the world and the Electronics Shop for the Control System of Power Generation Plant. There is no charge for this visit but number of visitors are limited to 50 persons, the applications

will be accepted in order of arrival. Contact Prof. Higuchi at Nagasaki University (Phone +81-958-47-1111, Fax +81-958-46-7379, e-mail higuchi@ec.nagasaki-u.ac.jp).

Welcome Party

A welcome party will be held in the lobby of the Largo Hall between 19:00 and 21:00 on May 31 (Wed). All participants and their guests are invited free of charge.

Banquet

A banquet will be held in the Room-A and -B of the Largo Hall starting at 19:00 on Jun 1 (Thu). General participants are invited free of charge. Extra tickets for their families and students are available at 10,000yens/person.

Family Program

A sight-seeing tour of Nagasaki city is provided as the family program at free of charge. The tour starts from Largo Hall at 9:30 on Jun 2 (Fri) and returns to Ioujima at 16:45, lunch is included.

Authors information

Oral Presentations

All speakers for a session are required to meet their session chairperson half an hour before the opening of the session. The chairperson will confirm your presentation, and local requirement for your presentation may be offered. Biographical information form should be submitted to the chairperson at this meeting. Because of the closed conference atmosphere, you will be able to find the chairperson easily. If you unfortunately cannot, please make contact to the Secretariat. Two over head projectors can be used simultaneously, but if you use a slide projector, only one over head projector is available.

Poster Presentations

Please contact the front desk at the session room before you start to mount your poster. Thumbtacks will be available at the desk. Attach your materials to the panels assigned by the symposium secretariat. The program number of your poster presentation is indicated at the upper-left corner of the panel. Speakers are expected to be present at their poster display during the session time. The only official language for poster displays is English. All materials to be mounted on the panel should have description in English.

Date	Mounting Time	Session Time	Removal Time
1. June (Thu.)	11:00~13:00	13:00~14:50	14:50~17:00
2. June (Fri.)	11:00~13:15	13:15~15:15	15:15~17:00

Authors are requested to follow the above schedule in mounting their posters on their assigned panels. Please note that the removal time must be strictly adhered to, as posters which are left on display beyond the time will be discarded.

General Information

Climate

In Nagasaki rainy season starts from mid June and it is mostly fine during the conference. The temperature in Nagasaki ranges between 17C(63F) and 25C(77F). Light dresses will suffice in Nagasaki, but you are recommended to bring an umbrella.

Currency Exchange

Only Japanese Yen is acceptable at regular stores. Yen can be purchased at foreign exchange banks at international airports and in Nagasaki-City, but you **MUST NOT** forget exchanging your currency **BEFORE** going to Ioujima, since there are **NO** foreign exchange banks at the small island. The foreign exchange banks at Nagasaki City are as follows:

1. Juh-Hachi Bank: 十八銀行本店 銅座町 1-11 Phone: +81-958-24-1818
2. Juh-Hachi Bank: 十八銀行北支店 大黒町 14-5-1F Phone: +81-958-25-1800
3. Shinwa Bank: 親和銀行長崎支店 賑町 6-6 Phone: +81-958-24-6111
4. Shinwa Bank: 親和銀行 大波止支店 五島町 4-16 Phone: +81-958-22-8151
5. Fuji Bank: 富士銀行長崎支店 浜の町 3-28 Phone: +81-958-24-0156
6. Mitsubishi Bank: 三菱信託銀行長崎支店 銅座町 7-36 Phone: +81-958-22-0151.

If you do not know how to reach the banks, call to the phone numbers, or show the addresses written in Japanese at a tourist information desk, and ask the way.

Traveler's Checks and Credit Cards

The conference desk accepts only **CASH** of Japanese Yen. Major credit cards, *e.g.*, American Express, VISA, JCB, MasterCard and Diners Club, are accepted by the Hotel Renaissance Nagasaki Ioujima.

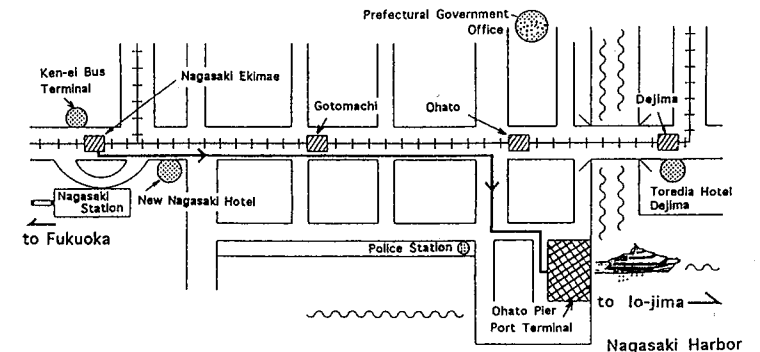
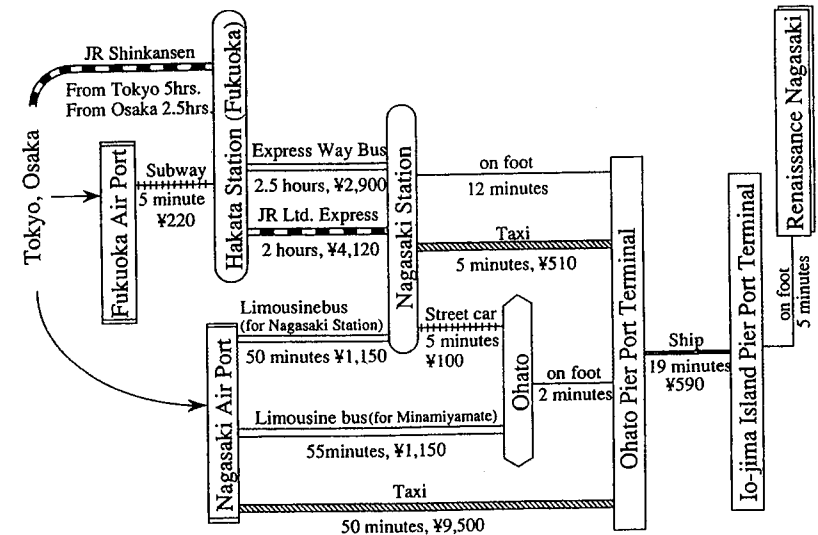
Hotel Reservation and Travel Bureau

If you need information on hotels for participating the symposium, contact Prof. Higuchi at Nagasaki University (Phone +81-958-47-1111, Fax +81-958-46-7379, e-mail higuchi@ec.nagasaki-u.ac.jp). Further travel information will be available at the registration desk during the symposium.

Access to the Conference Site

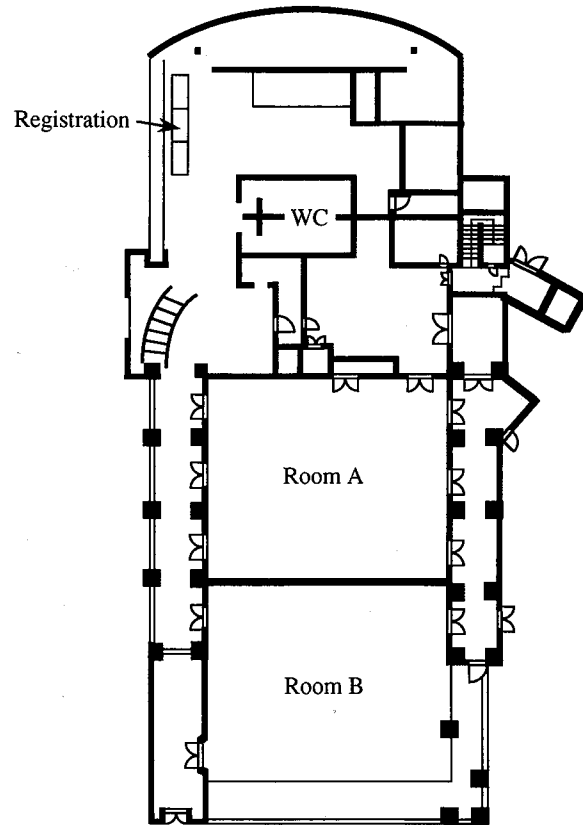
The Symposium will be held at the Renaissance Nagasaki in Ioujima island which is 19 minutes by ship from Nagasaki. The most convenient means for foreign participants to reach it is by domestic flight from Tokyo (Haneda) or Osaka (Kansai) to Nagasaki, if you take a flight to Tokyo (Narita) or Osaka (Kansai). You can also take a bullet train (Sinkansen Nozomi) from Tokyo or Osaka to Fukuoka (Hakata Station), then by train (Ltd. Express "Kamome") to Nagasaki. However, it takes 7 hours from Tokyo and 5 hours 30 minutes from Osaka. Another convenient way to Nagasaki is direct flight to Fukuoka International Airport, then by train to Nagasaki. It takes about 2 hours from Fukuoka to Nagasaki.

Routes to Renaissance Nagasaki

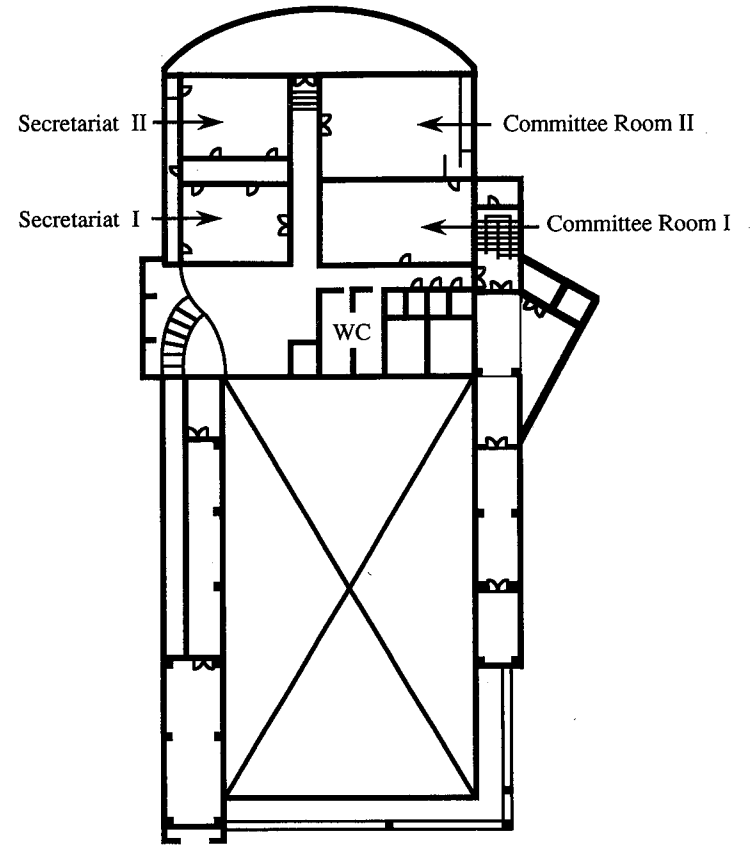


Floor Plan of Renaissance Nagasaki

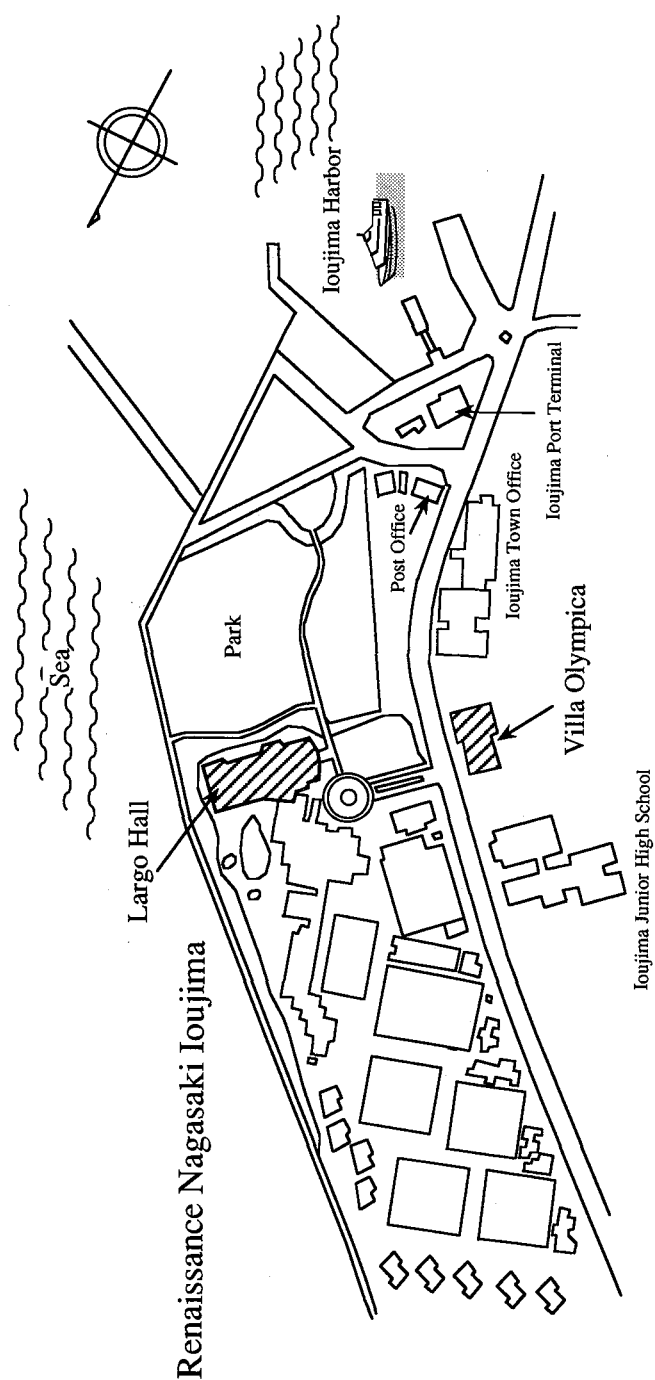
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F1



F2



TECHNICAL PROGRAM

Plenary Session

Thursday, 1. June, 9:00-12:00 at Largo Hall

9:00-9:30 Opening Address and Welcome Addresses

Chairperson: Prof. Yamada, E. (Nagasaki Univ., Japan)

Opening Address: Prof. Yamada, H. (Chairperson, Organizing Committee, Shinshu Univ., Japan)

Welcome Address: Mr. Takada, I. (Governor of Nagasaki Prefecture, Japan)

Welcome Address: Prof. Yokoyama, T. (President, Nagasaki Univ., Japan)

9:30-10:50 Keynote Speeches

Chairperson: Prof. Ohsaki, H. (The Univ. of Tokyo, Japan)

KN-1 Linear Electromagnetic Drives in Traffic Systems and Industry
Weh, H. (TU Braunschweig, Germany)

KN-2 Linear Drives for Industry Applications in Japan - history, existing state and future prospect -
Masada, E. (The Univ. of Tokyo, Japan)

11:00-12:00 Survey Lecture

Chairperson: Dr. Azukizawa, T. (Toshiba Corp., Japan)

SL-1 Research Activities of Scientific Papers on Linear Drives in the Transactions of IEE and Magnetics of Japan
Yamada, H. (Shinshu Univ., Japan), Ebihara, D. (Musashi Inst. of Tech., Japan)

SL-2 Present Status of the Research on Linear Electric Motors in Korea
Im, D.H., Hong, J.P. (Hanyang Univ., Korea)

Oral Session: Largo Hall A on Thursday, 1. June

15:00-16:20 Transportation-I

Co-Chairperson: Prof. Eastham, T.R. (Queen's Univ., Canada)

Co-Chairperson: Prof. Mizuma, T. (Traffic Safety and Nuisance Research Inst., Japan)

TR-1 Driving Power of Magnet Wheels

Fujii, N. (Kyushu Univ., Japan), Ogawa, K. (Oita Univ., Japan), Naotsuka, K., Ohjima, K. (Kyushu Univ., Japan), Matsumoto, T. (Yaskawa Electric Co., Japan)

TR-2 CAVE - A Project of a Vehicle with Linear Induction Motors

Correia, E., Branco, F., Verdelho, P., Esteves, J., Cabrita, C. (Instituto Superior Técnico, Portugal)

TR-3 Mechanisms Raising Speed of Response of Linear Motion Electrodynamic Systems
Afonin, A., Grebenikov, V., Schastliviy, V. (Nat'l Academy of Sci. of Ukraine, Ukraine)

TR-4 Dynamic Braking Characteristics of Linear Synchronous Motor with Permanent Magnet Secondary and Long Stators for Elevator
Yamaguchi, H., Watanabe, T. (Fuji Electric Corp. R.&D., Ltd., Japan)

16:30–17:30 Transportation-II

Co-Chairperson: Prof. Afonin, A. (Nat'l Academy of Sci. of Ukraine, Ukraine)

Co-Chairperson: Prof. Sone, S. (The Univ. of Tokyo, Japan)

TR-5 Characteristics of Combined Propulsion, Levitation and Guidance System with Asymmetric Figure between Upper and Lower Coils in EDS Maglev
Murai, T., Fujiwara, S. (Railway Technical Research Inst., Japan)

TR-6 Repulsive-Mode Levitation and Propulsion Control of a Land Travelling Marine-Express Model Train ME03
Yoshida, K., Takami, H. (Kyushu Univ., Japan), Shigemi, N. (Automation Technology Inc., Japan), Nagano, Y., Sonoda, A. (Kyushu Univ., Japan)

TR-7 Multi-Objective Optimization of Single Sided Linear Induction Motors for Urban Transit
Higuchi, T., Himeno, K. (Nagasaki Univ., Japan), Nonaka, S. (Kinki Univ., Japan)

Oral Session: Largo Hall A on Friday, 2. June

09:00–10:40 Magnetic Levitation-I

Co-Chairperson: Prof. Okada, Y. (Ibaraki Univ., Japan)

Co-Chairperson: Prof. Nakagawa, T. (Tokyo Denki Univ., Japan)

ML-1 Electromagnetic Stiffness and Damping Effects in the Secondary Suspension of a Superconducting MAGLEV Vehicle
Niikura, S., Kameari, A. (Mitsubishi Heavy Industries, Ltd., Japan), Igarashi, M., Kitano, J. (Central Japan Railway Co., Japan)

ML-2 Application of Phase-Locked Loops to Magnetic Suspension Systems
Mizuno, T., Araki, K. (Saitama Univ., Japan), Ishii, T. (Zexel Corp., Japan)

ML-3 Contactless Transportation Vehicle with 4 Hybrid-Excited Magnets and an Energysaving Levitation Control
Henneberger, G., Rödder, D. (RWTH Aachen, Germany)

ML-4 Analysis and Experimental Results of a Maglev Transportation System Using Controlled-PM Electromagnets with Decentralized Robust Control Strategy
Tzeng, Y.K., Wang, T.C. (National Tsing Hua Univ., R.O.China)

ML-5 Control Method for Switching Multi Supporting Magnets in a Magnetic Levitation System of a Flexible Steel Plate
Hayashiya, H., Seto, J., Ohsaki, H., Masada, E. (The Univ. of Tokyo, Japan)

10:55–12:15 Factory Automation-I

Co-Chairperson: Prof. Rees Jones, J. (Unilever Research Port Sunlight Lab., U.K.)

Co-Chairperson: Dr. Miyashita, K. (Hitachi, Ltd., Japan)

FA-1 Design and Analysis of Permanent Magnet Linear Synchronous Motors for Wide Speed Operation
Sanada, M., Morimoto, S., Takeda, Y. (Univ. of Osaka Prefecture, Japan)

FA-2 Large Capacity and High Speed Two-Stage Hydraulic Servo Valve Using a High Response Linear DC Motor
Mizuno, T., Anzai, T. (Amada Co., Ltd., Japan), Yamada, H. (Shinshu Univ., Japan)

FA-3 Modelling Improvement of a High Anisotropy Linear Reluctance Motor
Damiano, A., Marongiu, I. (Univ. di Cagliari, Italy), Del Pizzo, A., Perfetto, A. (Univ. di Napoli, Italy)

FA-4 High Thrust Density Linear Motor and Its Applications
Karita, M., Nakagawa, H., Maeda, M. (Shinko Electric Co., Ltd., Japan)

15:30–16:30 Factory Automation-II

Co-Chairperson: Prof. Gieras, J.F. (Univ. of Cape Town, South Africa)

Co-Chairperson: Prof. Takeda, Y. (Univ. of Osaka Prefecture, Japan)

FA-5 A Novel Electromagnetic Hammer and its Control
Chen, D.L., Chen, S.K. (Xi'an Jiaotong Univ., P.R.China), Yang, X.F. (Wuxi Electric Controlled Door & Window Factory, P.R.China)

FA-6 Effects of Molten Metal Flow on Glass Sheet Sinkage System Lightening Effective Density of Molten Metal with Linear Induction Motors
Iga, M., Sato, Y. (Asahi Glass Co., Ltd., Japan), Yamada, H. (Shinshu Univ., Japan)

FA-7 Research on Levitation Magnets Switching for Magnetically Levitated Conveyance System
Mori, S., Eguchi, M., Kanemitsu, Y. (Ebara Research Co., Ltd., Japan), Moriyama, S. (Kyushu Inst. of Tech., Japan)

16:45–17:45 Related Topics-I

Co-Chairperson: Prof. Dr.-Ing. Dr. h.c. Weh, H. (TU Braunschweig, Germany)

Co-Chairperson: Prof. Ohsaki, H. (The Univ. of Tokyo, Japan)

RT-1 Magnetic Suspension Using Soft Magnetic Materials and High-Tc Superconductors
Tsutsui, Y. (Yaskawa Electric Corp., Japan), Yamamoto, A. (The Univ. of Tokyo, Japan), Higuchi, T. (Kanagawa Academy of Sci. & Tech., Japan)

RT-2 Shielding Performance of High-Tc YBCO Superconductor and their Feasibility to Linear Actuator
Torii, S., Yasuda, I., Hosono, S., Ebihara, D. (Musashi Inst. of Tech., Japan)

RT-3 Study on Transportation-Switch for a Model Vehicle with Magnetic Flux Pinning Effects of HTSC
Suzuki, H., Kusano, K., Yogiashi, K., Takashige, M. (Iwaki Meisei Univ., Japan)

Oral Session: Largo Hall B on Thursday, 1. June

15:00-16:20 Motor Control-I

Co-Chairperson: Prof. Kim, K.T. (Changwon Nat'l Univ., Korea)

Co-Chairperson: Prof. Hikihara, T. (Kansai Univ., Japan)

MC-1 Linear Drives with Controlled Current Layer
Afonin, A., Szymczak, P., Bobako S. (Tech. Univ. of Szczecin, Poland)

MC-2 Vectorial Feeding Techniques for Asynchronous Linear Motor
Celentano, G., Gentile, G., Meo, S., Pagano, E. (Univ. "Federico II", Italy)

MC-3 Performance Evaluation of a Linear Pulse Servo Motor Position Control System with Two-Degree-of-Freedom Controller
Sugiura, M., Yamamoto, S., Matsuse, K. (Meiji Univ., Japan)

MC-4 Variable Structure Vector Controller Design for Position Control of Single-sided Linear Induction Motor
Kim, K.T. (Changwon Nat'l Univ., Korea), Son, Y.D. (Dongseo Univ., Korea)

16:30-17:30 Numerical Analysis-I

Co-Chairperson: Prof. Kawase, Y. (Gifu Univ., Japan)

Co-Chairperson: Prof. Yokoi, T. (Musashi Inst. of Tech., Japan)

NA-1 Analysis of a Linear Synchronous Motors with Buried Permanent Magnets
Gieras, J.F., Spannenberg, A., Wing, M. (Univ. of Cape Town, South Africa), Yamada, H. (Shinshu Univ., Japan)

NA-2 A New Circuitual Approach to Modelling the Longitudinal End Effects in LIMs
Mikulik, J., Sobczyk, T.J. (Cracow Univ. of Tech., Poland)

NA-3 Optimal Design of Linear DC Motor Using Finite Element Method
Takahashi, N., Muramatsu, K., Nakata, T. (Okayama Univ., Japan), Uehara, K. (ALPS Electric Co., Ltd., Japan)

Oral Session: Largo Hall B on Friday, 2. June

09:00-10:40 Numerical Analysis-II

Co-Chairperson: Prof. Sobczyk, T.J. (Cracow Univ. of Tech., Poland)

Co-Chairperson: Prof. Takahashi, N. (Okayama Univ., Japan)

NA-4 A 2D Finite Element Solver for Eddy Current Problems Involving Time-Harmonic Excitation and Relative Motion
Wang, Z., Eastham, T.R., Dawson, G.E., Gao, L., Liu, Z. (Queen's Univ., Canada)

NA-5 Finite Element Analysis of Inverter Fed Linear Induction Motors with Motion
Im, D.H., Kim, C.E. (Hanyang Univ., Korea), Jung, Y.B., Ryu, K.B., Choi, Y.J. (Hyosung Industries Co., Ltd., Korea), Kim, H.J. (Hanyang Univ., Korea)

NA-6 The Retarding Thrust Produced by the End Effect Travelling Wave in a Linear Induction Motor
Rodrigues, A.L. (New University of Lisbon, Portugal)

NA-7 Calculation of Equivalent Circuit Parameters and Performance Equations of Single-sided Linear Induction Motors
Nonaka, S. (Kinki Univ., Japan)

NA-8 Analysis of Linear Induction Motor by Means of Magnetic Equivalent Circuit
Cheng, L. (The Shanxi Province MAODA Automation Technology Co., P.R. China), Zhang, C. (Taiyuan Univ. of Tech., P.R. China), Li, Y. (Pingshuo ANTAIBAO Surface Mine, P.R. China), Cheng, X., Zhang Y. (Taiyuan Univ. of Tech., P.R. China)

10:55-12:15 Actuator-I

Co-Chairperson: Prof. Pagano, E. (Univ. di Napoli, Italy)

Co-Chairperson: Prof. Oyama, J. (Nagasaki Univ., Japan)

AC-1 Application of Direct Current Linear Electric Motors at a Self-contained Transport Installation
Belicov, V.T., Chistyakov, I.N. (Odessa Firm Investservice Ltd., Ukraine)

AC-2 A Magnetic Circuit Design Method of Linear DC Motor for Pen Recorder
Oda, J., Morimura, T. (Ohkura Electric Co., Ltd., Japan), Wakiwaka, H., Yajima, H., Yamada, H. (Shinshu Univ., Japan)

AC-3 Moving-Magnet Actuators for Reciprocating Electro-mechanical Systems
Clark, R.E., Smith, D.S., Howe, D., Mellor, P.H. (Univ. of Sheffield, U.K.)

AC-4 High Power Transducer using Giant Magnetostrictive Material
Yoshikawa, T., Kawamori, A., Kamata, H. (Oki Electric Ind. Co., Ltd., Japan), Wakiwaka, H., Kuwahara, K., Furihata, D. (Shinsyu Univ., Japan)

15:30-16:30 Actuator-II

Co-Chairperson: Prof. Chen, S.K. (Xi'an Jiaotong Univ., P.R.China)
Co-Chairperson: Prof. Wakiwaka, H. (Shinshu Univ., Japan)

- AC-5 Operation Characteristics of Linear Pulse Motor for Artificial Satellite Fuel Pump System
Oyama, J., Higuchi, T., Abe, T., Terazono, K., Yamada, E. (Nagasaki Univ., Japan)
- AC-6 Improved Linearity Linear-Variable-Differential-Transformers for Short-Stroke Linear Actuators
Midgley, G.W., Howe, D., Mellor, P.H. (Univ. of Sheffield, U.K.)
- AC-7 Introduction of Hy-brid Type Linear Vernier Motor and Its Fundamental Analysis
Matsushima, Y. (Shizuoka Univ., Japan), Anazawa, Y. (Akita Univ., Japan), Ito, Y. (Hokkaido Univ., Japan)

16:45-17:45 Actuator-III

Co-Chairperson: Prof. Howe, D. (Univ. of Sheffield, U.K.)
Co-Chairperson: Dr. Karita, M. (Shinko Electric Co., Ltd., Japan)

- AC-8 Two-axis Linear Stepping Motors for Surface Drive and Their Applications
Hirai, J., Katuma, T., Nitta, Y., Konoha, Y. (Yaskawa Elec. Corp., Japan), Payne, J.D. (Yaskawa America, U.S.A.)
- AC-9 Performance Characteristics of New Type Cylindrical Linear Pulse Motors Driven by Microstep
Dohmeki, H., Satomi, H., Kuraishi, Y., Iwasa, T. (Oriental Motor Co., Ltd., Japan)
- AC-10 Cubic Type Linear DC Motor
Kano, Y., Shishido, J., Sato, S. (Tokyo Univ. of Agriculture and Tech., Japan), Matsuno, M. (KGS Co., Japan)

Poster Session: Villa Olympica on Thursday 1. June

13:00-14:50 Poster Session-I

Co-Chairperson: Prof. Kawanishi, T. (Nihon Univ., Japan)
Co-Chairperson: Dr. Fujisaki, K. (Nippon Steel Corp., Japan)

Transportation-III

- TR-8 Two Methods for Compensation of End-effects in Linear Induction Motor
Khawatmi, M. (Univ. of Pisa, Italy)
- TR-9 Study of Various Secondary to Raise Braking Force on the Electromagnetic Eddy Current Brake
Um, Y.S., Torii, S., Watada, M., Ebihara, D. (Musashi Inst. of Tech., Japan), Ichikawa, S., Sanjo, I. (Tokyo Buhin Kogyo Co., Ltd., Japan)

- TR-10 The Production of the Linear Induction Motor Driven System with Primary Side on Ground for the Test of Transport System
Amano, T., Mizuma, T., Matumoto, A. (Traffic Safety and Nuisance Research Inst., Japan)
- TR-11 Inverse Design of Linear Induction Motor for Subway Using Neural Network and FEM
Im, D.H., Park, S.C., Lee, I.H. (Hanyang Univ., Korea)
- TR-12 Dynamic Characteristics Prediction of Linear Motor Car by Neural Network and FEM
Im, D.H., Park, S.C., Jang, K.B. (Hanyang Univ., Korea)

Magnetic Levitation-II

- ML-6 A New Electromagnetic Guidance Technology Combined with a Levitation System for a Maglev Vehicle with a Rigid Body
Morishita, M., Morikawa, M. (Toshiba Corp., Japan)
- ML-7 The Influence to the Stiffness by the Vibration of the Sensor Stage on Active Magnetic Bearing
Hara, S., Kubo, M. (Nachi-fujikoshi Corp., Japan), Namerikawa, T., Matsumura, F. (Kanazawa Univ., Japan)
- ML-8 Linear Actuator Control for Regenerative Vibration Damper
Okada, Y., Harada, H. (Ibaraki Univ., Japan), Iwata, Y., Suzuki, K. (Tokyo Metropolitan Univ., Japan), Tan, A.C.C. (Queensland Univ. of Tech., Australia)
- ML-9 Mechanism of Magnetic Damping in the Superconducting Magnetic Levitation System
Higashi, K., Ohashi, S., Ohsaki, H., Masada, E. (The Univ. of Tokyo, Japan)
- ML-10 Study on Coupled Vibration of Magnetically Levitated Bodies in Electrodynamics Suspension System
Nakadai, S., Nagai, M. (Tokyo Univ. of Agriculture and Tech., Japan)
- ML-11 Noncontact Manipulation by Motion Control of Permanent Magnet
Oka, K., Higuchi, T. (The Univ. of Tokyo, Japan), Yoshida, S. (Hitachi, Ltd., Japan)
- ML-12 Repulsive Magnetic Levitation Systems with Movable Permanent Magnets
Mizuno, T., Araki, K. (Saitama Univ., Japan), Ouchi, T. (Sanoh Industrial Co., Ltd., Japan)

Factory Automation-III

- FA-8 Performances of Impact Drive Mechanism on Oiled-Surface
Furutani, K. (Toyota Tech. Inst., Japan), Higuchi, T. (The Univ. of Tokyo, Japan), Yamagata, Y. (Kanagawa Academy of Sci. & Tech., Japan), Mohri, N. (Toyota Tech. Inst., Japan)

- FA-9 A Study on the Generated Forces with the Lateral Displacement of Linear Induction Motor
Shudo, K., Noda, Y., Shimizu, H., Torii, S., Ebihara, D. (Musashi Inst. of Tech., Japan), Funato, N. (Tokyu Construction Co., Ltd., Japan), Karita, M. (Shinko Electric Co., Ltd., Japan), Sato, M., Shima, T. (Inst. for Posts & Telecommunications Policy, Japan)
- FA-10 Study on the Reduction of Detent Force of Permanent Magnet Linear Synchronous Motor
Yoshimura, T., Watada, M., Torii, S., Ebihara, D. (Musashi Inst. of Tech., Japan)
- FA-11 Study on Superconductive Magnetic Gradient Levitation for In-facility Transportation
Ohsaki, H. (The Univ. of Tokyo, Japan)
- FA-12 Performance Analysis of Controlled-PM LSM Maglev Carrier with Lateral Displacement by 3-D FEM
Yoshida, K., Lee, J., Omura, T. (Kyushu Univ., Japan)
- FA-13 A Consideration on Magnetic Materials for a High Response Type Linear DC Motor
Mizuno, T., Anzai, T. (Amada Co., Ltd., Japan), Suzuki, T., Yamada, H. (Shinshu Univ., Japan)
- FA-14 Development of Linear Synchronous Motor for Air Suspension Table
Kyutoku, S., Shinya, T. (Shinko Electric Co., Ltd., Japan)
- FA-15 A Linear Synchronous Motor for a Clean-Room Conveyance System
Henneberger, G., Reuber, C. (RWTH Aachen, Germany)
- FA-16 Special Linear Electric Mechanisms for Medical Prophylactic and Trainers Complexes
Belicov, V.T., Chistyakov, I.N. (Odessa Firm Investservice Ltd., Ukraine)

Motor Control-II

- MC-5 Linear Induction Drive System for High Precision Processing
Janke, C., Berger, G., Gens, W. (Technical University of Ilmenau, Germany)
- MC-6 High Performance Positioning System with Linear DC Motor under Self-Tuning Fuzzy Control
Urushihara, S., Kamano, T., Suzuki, T., Harada, H. (The Univ. of Tokushima, Japan)
- MC-7 One Approach by μ -Synthesis to Robust Speed Control System for Linear Motor with Inertia Perturbation
Matsumura, M., Sugimoto, H. (Fuku Univ., Japan)
- MC-8 Identification of Variable Parameters and Evaluation of Dynamic Performance of a Linear Induction Motor
Zhang, Z., Dawson, G.E., Eastham, T.R. (Queen's Univ., Canada)

Numerical Analysis-III

- NA-9 Tubular Induction Actuators - A New Method of Calculus and Analysis of the Magnetic Field
Gonçalves, J.G., Cabrita, C.P. (Instituto Superior Técnico, Portugal)
- NA-10 A New Approach to the Determination of the Propulsive Force of LIMs
Mikulik, J. (Cracow Univ. of Tech., Poland)
- NA-11 A 3-Phase Equivalent Circuit of LIM and its Element-Value Determination
Utsumi, T., Yamaguchi, I. (Tokai Univ., Japan)
- NA-12 An Approach to a Suitable Secondary Shape for Improving the End Effect of a Short Rotor Double-sided Linear Induction Motor
Onuki, T., Kurimoto, Y., Kamiya, Y., Hara, T. (Waseda Univ., Japan)
- NA-13 Analysis of Inverter-Fed Linear Induction Motors
Gieras, J.F. (Univ. of Cape Town, South Africa)
- NA-14 Performance Calculation for a Shaded-pole Single-sided Linear Induction Motor Using Finite-Element Method
Davidson, I.E., Gieras, J.F. (Univ. of Cape Town, South Africa)
- NA-15 Analytic Calculation of the Angular Dependency of the Thrust Provided by a Linear Synchronous Motor
Trapanese, M. (Univ. di Palermo, Italy)

Actuator-IV

- AC-11 Thrust Force Control of Surface Motor with Positional Feedback to Realize High Response and High Precision
Takahashi, T., Yabuuchi, Y., Watada, M., Torii, S., Ebihara, D. (Musashi Inst. of Tech., Japan)
- AC-12 Performance Characteristics of a Linear Motor-driven Total Artificial Heart for the Second Step
Yamada, H., Kobayashi, M., Watanabe, M. (Shinshu Univ., Japan), Yamaguchi, M. (Brother Industries, Ltd., Japan), Karita, M., Maeda, M. (Shinko Electric Co., Ltd., Japan), Fukunaga, S. (Hiroshima Univ., Japan)
- AC-13 A Basic Study of Linear Oscillatory Actuator for Artificial Heart
Watada, M., Oishi, Y., Abe, K., Honda, T., Ebihara, D. (Musashi Inst. of Tech., Japan), Kasugai, T. (Futaba Electromagnetic, Japan), Isoyama, T., Imachi, K. (The Univ. of Tokyo, Japan)
- AC-14 Linear Motor System for High Speed and High Accuracy Position Seek
Aoyama, H., Araki, H., Yoshida, T., Mukai, R., Takedomi, S. (Hitachi Metals Co., Ltd., Japan)

Poster Session: Villa Olympica on Friday, 2. June

13:15-15:15 Poster Session-II

Co-Chairperson: Prof. Yamamoto, Y.(Nagano Nat'l College of Tech., Japan)

Co-Chairperson: Dr. Sato, Y.(Asahi Glass Co.,Ltd., Japan)

Transportation-IV

- TR-13 The Study of the Control System for Ropeless Elevator with Vertical Linear Synchronous Motor
Kim, H.J., Muraoka, I., Torii, S., Watada, M., Ebihara, D.(Musashi Inst. of Tech., Japan)
- TR-14 Experimental and Operational Study on Vertical Transportation System Driven by a Linear Synchronous Motor Using Permanent Magnets
Miyatake, M., Ishikawa, N., Koseki, T., Sone, S.(The Univ. of Tokyo, Japan)
- TR-15 Vertical Motion Analysis of a Linear Induction Motor Elevator
Yamada, H., Nakamura, Y., Nakada, T.(Shinshu Univ., Japan), Meguro, T.(Hitachi Building Systems Eng. and Service Co.,Ltd., Japan), Shinya, T.(Shinko Electric Co.,Ltd., Japan), Gieras, J.F.(Univ. of Cape Town, South Africa)
- TR-16 Modelling of the Speed Control System for a Linear Synchronous Motor
Sakamoto, T.(Kyushu Inst. of Tech., Japan)
- TR-17 The Production of the Linear Synchronous Motor Driven System with Primary Side on Ground for the Test of Transport System
Mizuma, T., Amano, T.(Traffic Safety and Nuisance Research Inst., Japan), Nakamura, K., Fujino, M.(Kobe Steel Ltd., Japan)
- TR-18 Characteristics of Electrodynamics Suspension System with the Combination of Levitation and Propulsion
Okamoto, E., Torii, S., Watada, M., Ebihara, D.(Musashi Inst. of Tech., Japan), Komura, S., Ohhara, T.(Chugai Ro Co.,Ltd., Japan)
- TR-19 The Frequency Characteristics of the MAGLEV Power Feeding Circuit
Ema, S.(Numazu College of Tech., Japan)

Magnetic Levitation-III

- ML-13 An Anticipatory Control Technique for Magnetically Levitated System
Verso, G.L., Scordato, G.S., Trapanese, M.(Univ. di Palermo, Italy)
- ML-14 Levitation Characteristics of Collectively Controlled MAGLEV for the Various Speed
Im, D.H., Hong, J.P., Hur, J., Jung, I.S.(Hanyang Univ., Korea)
- ML-15 Nonlinear Adaptive Control for a Magnetic Levitation System
Hao, S.H., Yang, Z.J., Tsuji, T.(Kyushu Inst. of Tech., Japan), Oguro, R.(Yasukawa Electric Corp., Japan)

- ML-16 An Application of H_{∞} Sampled-Data Control to a Magnetic Levitation System
Qi, R.D., Tsuji, T.(Kyushu Inst. of Tech., Japan)
- ML-17 A Study of the Ride Comfort on a 3 Module Type of Magnetically Levitated Vehicle
Nagai, M., Nakagawa, T.(Tokyo Denki Univ., Japan), Matsumoto, A.(Traffic Safety & Nuisance Research Inst., Japan)

Factory Automation-IV

- FA-17 Driving Characteristics of Magnetic Suspension System by Linear Induction Motor
Okuyama, M., Yasuda, Y., Hikihara, T., Hirane, Y.(Kansai Univ., Japan)
- FA-18 Winding and Power Supply for Surface Induction Motors
Fujii, N.(Kyushu Univ., Japan), Ogawa, K.(Oita Univ., Japan), Nishimura, K., Imazu, Y.(Kyushu Univ., Japan)
- FA-19 Linear Motor Application for Architecture
Kawanishi, T.(Nihon Univ., Japan)
- FA-20 Elastic Wave Signal Processing on a Long Scale Displacement Sensor Using Magnetostrictive Wire
Wakiwaka, H., Shimada, M., Hattori, S.(Shinshu Univ., Japan), Nishiyama, J., Murata, K., Ito, K.(Tsubakimoto Chain Co., Japan)
- FA-21 Magneto-hydrodynamics Calculation by Shadow Method in Free Surface
Fujisaki, K., Ueyama, T.(Nippon Steel Corp., Japan)
- FA-22 The Analysis and Optimization of Ladder Type LIM
Im, D.H., Yoon, S.B., Hur, C.H.(Hanyang Univ., Korea)
- FA-23 Dynamic Consideration and Candidacy Requirements for Linear Servo-Driven Motors in Factory Automation
Rees Jones, J.(Unilever Research Port Sunlight Lab., U.K.)

Motor Control-III

- MC-9 Dynamic Characteristics Analysis of LIM's Vector Control Using FEM
Im, D.H., Kwon, B.I., Lee, J.H., Kim, C.E.(Hanyang Univ., Korea), Jung, Y.B.(Hyosung Industries Co.,Ltd., Korea)
- MC-10 Performances of a L.I.M. under a Particular Control Strategy
Gentile, G., Meo, S.(Univ. "Federico II", Italy), Rotondale, N.(Univ. di L'Aquila, Italy), Scarano, M.(Univ. di Cassino, Italy)
- MC-11 The Value of Additional Choke Inductance for Motors Drive Experimental Results
Khawatmi, M.(Univ. of Pisa, Italy)
- MC-12 The Static Torque Gradient Regulation for the Three Phase Round Rotor Synchronous Machine with Two Orthogonal Fields (D.W.R.R.)
Bruno, O., Khawatmi, M., Mariotti, G.(Univ. of Pisa, Italy)

Numerical Analysis-IV

- NA-16 Object-Oriented Programming Methodology in the Program Development for the Analysis and Optimal Design of Linear Motors
Yokoi, T., Matsuyama, M., Ebihara, D.(Musashi Inst. of Tech., Japan)
- NA-17 Eddy Current Solutions of Magnet Wheels
Ogawa, K.(Oita Univ., Japan), Fujii, N.(Kyushu Univ., Japan)
- NA-18 Linear Current Density - A New Method of Calculus and Analysis
Gonçalves, J.G., Cabrita, C.P.(Instituto Superior Técnico, Portugal)
- NA-19 Numerical Computation of Transient Eddy Current Field and Its Application to Arc Motor with Solid Rotor
Liang, D.L., Chen, S.K. (Xi'an Jiaotong Univ., P.R.China)
- NA-20 A Study on the Gap Reluctance Distribution by the Slot Shape in LPM
Nirei, M., Murata, M., Yamamoto, Y.(Nagano Nat'l College of Tech., Japan), Yamada, H.(Shinshu Univ., Japan)
- NA-21 3-D Transient Analysis of Dynamic Response of AC Operated Linear Electromagnetic Actuators
Kawase, Y., Tatsuoka, S.(Gifu Univ., Japan), Ito, S.(Fukuoka Inst. of Tech., Japan)
- NA-22 Dynamic Analysis of a Cylindrical Moving-core Linear Oscillatory Actuator
Xiong, G., Liu, X.(Taiyuan Univ. of Tech., P.R.China), Yamada, H.(Shinshu Univ., Japan)
- NA-23 Characteristics of Linear Reluctance Motor with an Improved Secondary Member
Tanino, K., Ogawa, K.(Oita Univ., Japan)

Actuator-V

- AC-15 Linear Synchronous Motor Using Reed Switch
Kano, Y., Wang, N.X., Shishido, J.(Tokyo Univ. of Agriculture and Tech., Japan)
- AC-16 AC Drive Variable Capacitance Motor Design Optimization Using Surface Charge Method
Niino, T., Higuchi, T.(The Univ. of Tokyo, Japan), Egawa, S.(Kanagawa Academy of Sci. & Tech., Japan)
- AC-17 Transport of Carriers in Magnetic Brush Development Process of Electrophotography
Kawamoto, H. (Fuji Xerox Co.,Ltd., Japan)
- AC-18 Simulation for Magnetization and Detection on Magnetic Rotary Encoder
Kikuchi, Y., Kusama, K.(Sankyo Seiki Mfg. Co.,Ltd., Japan), Yamamoto, Y.(Nagano Nat'l College of Tech., Japan), Wakiwaka, H., Yamada, H.(Shinshu Univ., Japan)

- AC-19 Development of Parallel Link Manipulator with Inchworm Mechanisms
Shibatani, K., Furutani, K., Ishikura, S., Hakamata, S., Mohri, N.(Toyota Technological Inst., Japan)

- AC-20 Standing Wave Type Reciprocating Motion Ultrasonic Motor
Yamamoto, Y., Nirei, M.(Nagano Nat'l College of Tech., Japan), Kikuchi, Y.(Sankyo Seiki Mfg. Co.,Ltd., Japan)

Related Topics-II

- RT-4 The Application of Metal Powder Technology for Linear Motors
Afonin, A.(Tech. Univ. of Szczecin, Poland)

Closing Session: Largo Hall A

17:50-18:10 Closing Address

Chairperson: Prof. Yamada, E. (Nagasaki Univ., Japan)