

科技资料

15790

# Electromagnetic Forces and Applications

Elsevier Studies in  
Applied Electromagnetics in Materials, 1

# ELECTROMAGNETIC FORCES AND APPLICATIONS

*Proceedings of the Third International ISEM Symposium on  
the Application of Electromagnetic Forces  
Sendai, Japan, 28-30 January, 1991*

*Supplement to Volume 2 of the  
International Journal of  
Applied Electromagnetics in Materials*

*Editors:*

**J. TANI AND T. TAGAKI**

*The Institute of Fluid Science  
Tohoku University  
Sendai 980, Japan*



ELSEVIER

AMSTERDAM • LONDON • NEW YORK • TOKYO 1992

ELSEVIER SCIENCE PUBLISHERS B.V.  
Sara Burgerhartstraat 25  
P.O. Box 211, 1000 AE Amsterdam, The Netherlands

*Distributors for the United States and Canada:*

ELSEVIER SCIENCE PUBLISHING COMPANY, INC.  
655 Avenue of the Americas  
New York, N.Y. 10010 USA

**Library of Congress Cataloging-in-Publication Data**

International ISEM Symposium on the Application of Electromagnetic Forces (3rd : 1991 : Sendai-shi, Japan)

Electromagnetic forces and applications : proceedings of the Third International ISEM Symposium on the Application of Electromagnetic Forces, Sendai, Japan, 28-30 January 1991 / editors, J. Tani and T. Takagi.

p. cm. -- (Elsevier studies in applied electromagnetics in materials; 1)

"Supplement to volume 2 of the International journal of applied electromagnetics in materials."

ISBN 0-444-89106-4

1. Electromagnetism--Congresses. I. Tani, J. II. Takagi, T. (Toshiyuki). 1954-. III. International journal of applied electromagnetics in materials. No. 2 (Supplement) IV. Title. V. Series.

QC759.6.I57 1991

537--dc20

91-43180  
CIP

ISBN: 0 444 89106 4

© 1992 ELSEVIER SCIENCE PUBLISHERS B.V. All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher, Elsevier Science Publishers B.V., Permissions Department, P.O. Box 521, 1000 AM Amsterdam, The Netherlands.

Special regulations for readers in the U.S.A. - This publication has been registered with the Copyright Clearance Center Inc. (CCC), Salem, Massachusetts. Information can be obtained from the CCC about conditions under which photocopies of parts of this publication may be made in the U.S.A. All other copyright questions, including photocopying outside of the U.S.A., should be referred to the copyright owner, Elsevier Science Publishers B.V., unless otherwise specified.

No responsibility is assumed by the publisher for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein.

pp. 327-330, 411-414, 485-488, 489-492: copyright not transferred.

Printed in The Netherlands

## INTERNATIONAL STEERING COMMITTEE

J.Tani (Chairman)	Tohoku University, Japan
K.Bessho	Kanazawa University, Japan
A.Bossavit	EDF, France
L.E.Cross	Pennsylvania State University, USA
M.Date	Osaka University, Japan
M.Enokizono	Oita University, Japan
M.Esashi	Tohoku University, Japan
T.Higuchi	University of Tokyo, Japan
T.Honma	Hokkaido University, Japan
S.R.H.Hoole	Harvey Mudd College, USA
R.K.T.Hsieh	Royal Institute of Technology, Sweden
N.Ida	University of Akron, USA
Y.Kagawa	Okayama University, Japan
S.Kamiyama	Tohoku University, Japan
F.Matsumura	Kanazawa University, Japan
S.Minagawa	Electro-Communication University, Japan
K.Miya	University of Tokyo, Japan
G.Molinari	University of Genoa, Italy
F.C.Moon	Cornell University, USA
U.Muller	KFK Karlsruhe, FRG
T.Nakata	Okayama University, Japan
J.P.Nowacki	Polish Academy of Sciences, Poland
T.Onuki	Waseda University, Japan
R.E.Rosenzweig	Exxon, Annandale, USA
Y.Saito	Hosei University, Japan
G.Schweitzer	ETH Zurich, Switzerland
W.S.Trimmer	AT&T Bell Laboratory, USA
C.W.Trowbridge	Vector Fields Ltd., UK
Y.Uchikawa	Nagoya University, Japan
K.Uchino	Sophia University, Japan
A.A.F.van de Ven	Eindhoven University of Technology, The Netherlands
K.Yoshida	Kyushu University, Japan
T.Takagi	Tohoku University, Japan

(General Secretary)

## LOCAL STEERING COMMITTEE

T.Date	NKK Corporation
K.Fujita	Mitsubishi Heavy Industries, Ltd.
H.Fujita	The University of Tokyo
S.Fujiwara	Railway Technical Research Institute
H.Hashimoto	Tohoku University
J.Hokkyo	Sony Magnetic Products Inc.

N.Isozai	Japan Magnetic Bearings Co. Ltd.
A.Iwanaga	Tohoku Alps
K.Kakuda	Nippon Seiko K.K.
Y.Kanemitsu	Ebara Research
M.Karita	Shinko Electric Co., Ltd.
M.Kojima	Sanyo Denki Co., Ltd.
O.Matsuishi	Hitachi, Ltd.
T.Morita	Fuji Electric Corporation
Y.Morita	Sumitomo Metal Industries, Ltd.
M.Nagase	Tohoku Electric Power Co.
K.Nagaya	Gunma University
K.Nakatsuka	Tohoku University
N.Ninomiya	Nichicon Corporation
H.Ogiwara	Toshiba Corporation Ltd.
J.Ohmata	Meiji University
T.Ohno	Tokin Corporation
S.Saito	Ishikawajima-Harima Heavy Industries, Ltd.
Y.Sakamoto	Kobe Steel, Ltd.
M.Sato	The Furukawa Electric Co., Ltd.
K.Seio	National Defense Academy
Y.Shindo	Kawasaki Heavy Industries, Ltd.
K.Sorimachi	Kawasaki Steel Corporation
T.Sumimoto	Yaskawa Electric MFG. Co., Ltd.
T.Tagawa	Meitec Corporation
K.Takeda	Nippon Steel Corporation
T.Tanahashi	Keio University
T.Toda	Meidensha Corporation
K.Yada	OMRON Corporation
I.Yamada	Nippon Telegraph and Telephone Corporation
M.Yamada	Toyota Central Res. & Develop. Labs, Inc.
A.Yamamura	Japan Ferro Fluidics Corporation
R.Yamane	Tokyo Institute of Technology
S.Yokota	Mitsubishi Electric Corporation

#### LOCAL ORGANIZING COMMITTEE

S.Chonan	Tohoku University
M.Enokizono	Oita University
M.Esashi	Tohoku University
T.Honma	Hokkaido University
S.Ido	Saitama University
K.Koike	Tohoku Gakuin University
H.Kojima	Gunma University
H.Matsuki	Tohoku University
E.Matsumoto	Kyoto University

A.Motoe	Toshiba Corporation Ltd.
S.Motoki	University of Osaka City
M.Nagai	Tokyo University of Agriculture and Technology
H.Nishiyama	Tohoku University
K.Nonami	Chiba University
Y.Okada	Ibaraki University
T.Ono	Ono Sokki Co., Ltd.
Y.Saito	Hosei University
Y.Shindo	Tohoku University
T.Takagi	Tohoku University
K.Tanaka	Hitachi, Ltd.
K.Yoshida	Keio University

### SESSION ORGANIZERS

Piezoelectric Actuator	K.Uchino(Sophia University)
Nondestructive Testing	T.Takagi(Tohoku University)
Microactuator	M.Esashi(Tohoku University)
Superconductivity	J.Tani(Tohoku University)
Magnetic Damper	K.Nagaya(Gunma University)
Magnetic Fluid	T.Tanahashi(Keio University)
Melted Steel	R.Yamane(Tokyo Institute of Technology)
Electromagnetic Materials	E.Matsumoto(Kyoto University)
Magnetic Bearing	Y.Okada(Ibaraki University)
Computational Electromagnetics	T.Honma(Hokkaido University)
Magnetic Levitation	K.Yoshida(Kyushu University)
Wave Propagation	Y.Shindo(Tohoku University)

### SPONSORS

Asahi Glass Co., Ltd.  
 Ebara Research Co., Ltd.  
 Fuji Electric Corporation  
 Fuji Heavy Industries, Ltd.  
 Hitachi, Ltd.  
 Ishikawajima-Harima Heavy Industries, Ltd.  
 Japan Ferro Fluidics Corporation  
 Japan Magnetic Bearings Co., Ltd.  
 Kajima Corporation  
 Kawasaki Heavy Industries, Ltd.  
 Kawasaki Steel, Ltd.  
 Kobe Steel, Ltd.  
 Mayekawa MFG. Co., Ltd.  
 Meidensha Corporation

Meitec Corporation  
Mitsubishi Electric Corporation  
Mitsubishi Heavy Industries, Ltd.  
Moriyama Electric Corporation  
NEC Corporation  
Nichicon Corporation  
Nippondenso Co., Ltd.  
Nippon Seiko K. K.  
Nippon Steel Corporation  
NKK Corporation  
NOK Co., Ltd.  
Ohbayashi Corporation  
Sanyo Denki Co., Ltd.  
Shinko Electric Co., Ltd.  
Sony Magnetic Products Inc.  
Sumitomo Heavy Industries, Ltd.  
Sumitomo Metal Industries, Ltd.  
The Furukawa Electric Co., Ltd.  
The Kahoku Shinpo Press  
Takachihoseiki Co.,Ltd.  
Tohoku Alps Co., Ltd.  
Tohoku Electric Power Company  
Tohoku RICOH Co.,Ltd.  
Tokin Corporation  
Torishima Industries, Ltd.  
Toshiba Corporation  
Tokai Rubber Co., Ltd.  
Toyoseikan Co., Ltd.  
Toyota Central Res. & Develop. Labs., Inc.  
Tsubakimoto Emerson Corporation  
Yamayo Denki Co.,Ltd.  
Yaskawa Electric MFG. Co., Ltd.

## **EXHIBITORS**

Century Research Center Corporation  
Kyokuto Boeki Kaisha Ltd. / Vector Fields, Ltd.  
Nippon LEM K.K.  
Nippon Seiko K.K.  
Ono Sokki Co., Ltd.  
Tokyo Denki Tokki Co., Ltd.

## LIST OF ISEM-SYMPORIUM PARTICIPANTS

Paul L. Allaire  
Dept. of Mech. and Aero. Engr.  
University of Virginia  
Thornton Hall, Charlottesville  
Virginia, 22901  
USA

Gennichi Anami  
Railway Technical Research Institute  
2-8-38 Hikari-cho  
Kokubunji-shi, Tokyo, 185  
Japan

Isamu Aoki  
Kanagawa University  
3-27-1 Rokkakubashi  
Kanagawa-ku, Yokohama 221  
Japan

Mamoru Aoyagi  
Dept. of Electrical and Information  
Eng.  
Yamagata University  
4-3-16, Johman, Yonezawa, Yamagata  
992  
Japan

Yasuo Arai  
Research Institute of Electrical  
Communication  
Tohoku University  
2-1-1 Katahira, Aoba-ku, Sendai 980  
Japan

Yasuo Araki  
Electronic Applications Lab  
Fukasago R&D Center  
Mitsubishi Heavy Ind., Ltd.  
2-1-1 Shidhamo, Atami-cho, Fukasago  
676  
Japan

Shigeo Asai  
Faculty of Engineering  
Nagoya University  
Tsuru-cho, Chikusa-ku, Nagoya 464  
Japan

Kazuo Asano  
The Institute of Fluid Science  
Tohoku University  
2-1-1 Katahira, Aoba-ku, Sendai 980  
Japan

Jan Awrejcewicz  
Institute of Applied Mechanics  
Technical University of Lodz  
Siedlowskiego 1/15  
90-457 Lodz  
Poland

Jean-Claude Baeri  
Labo. Ultrasons  
Tour 13, 4 place Jussieu,  
75252 Paris, Cedex 05  
France

Victor Grigorii Bashkov  
Byelorussian Polytechnic Institute  
Lenin Ave. 65, Minsk  
220027  
USSR

Kazuo Bessho  
Faculty of Engineering  
Kanazawa University  
20-30 Kodatsuno, Kanazawa 920  
Japan

Elmars Blums  
Institute of Physics  
Latvian Academy of Sciences  
Salaspils, Latvia 229021  
USSR

Alain Bossavit  
EDF  
1 AV ed Gauille  
92141 Clamart  
France

Per-zen Chang  
217 Kimball Hall  
Cornell University  
Ithaca, NY 14853  
USA

Yun Hyun Cho  
Korea Electrotechnology Research  
Institute  
KERI, POB No 20  
Chang Won, 641-120  
Korea

Seiji Chonan  
Faculty of Engineering  
Tohoku University  
Aza Aoba, Aramaki Aoba-ku, Sendai  
980  
Japan

Chan Shin Chou  
Institute of Applied Mechanics  
National Taiwan University  
Euper 107, Taiwan  
ROC

Teresa Lenkowska-Czerwinska  
Institute of Fundamental Technological  
Research  
Swietokrzyska 21  
00-049 Warsaw  
Poland

Waldemar G. Dahl  
Dept. of Mech. & Aero. Engr.  
University of Virginia  
Thornton Hall, Charlottesville  
Virginia, 22901  
USA

Muneyuki Date  
Dept. of Physics, Faculty of Science  
Osaka University  
Machikaneyama-cho, 1-1, Toyonaka  
Osaka 560  
Japan

Inkasaburo Date  
NNK Corporation  
1-1 Minamimatsudai-cho  
Kawasaki-ku, Kawasaki  
Japan

Debasish Dutta  
Tokyo Denki Tokki Co., Ltd.  
1-31-1 Honcho, Nakano-ku, Tokyo  
164  
Japan

Cris Emson  
Vector Fields, Ltd.  
24 Banksmead, Kidlington  
Oxford, OX5 1HJ  
UK

Ikuo Enokizawa  
Ono Sokki Co., Ltd.  
1-16-1 Hakusan  
Midori-ku, Yokohama  
Kanagawa 223  
Japan

Masato Endokizono  
Dept. of Electrical Eng.,  
Faculty of Eng.,  
Oita University  
700 Dannoharu, Oita 870-11  
Japan

Masayoshi Iashi  
Faculty of Engineering  
Tohoku University  
Aza Aoba, Aramaki Aoba-ku, Sendai  
980  
Japan

**Virgiliu Ircoreanu**  
**Polytechnical Institute of Bucharest**  
**Electrical Engineering Dept**  
**Spl. Independentei 313**  
**Bucuresti 77206**  
**Romania**

**Yoshinori Fuda**  
**Iokai Corporation**  
**6-7-1 Kooriyama**  
**Inahaku-ku, Sendai**  
**Japan**

**I. Fujita**  
**Mining College**  
**Akita University**  
**1-1 Iegata Gakuen-cho, Akita 010**  
**Japan**

**Koji Fujiwara**  
**Faculty of Engineering**  
**Okayama University**  
**3-1-1 Tsushima-naka**  
**Okayama, Okayama 700**  
**Japan**

**Shunsuke Fujiwara**  
**Railway Technical Research Institute**  
**2-8-38 Hikaricho**  
**Kokubunji, Tokyo 185**  
**Japan**

**Hirotsugu Fujiwara**  
**Sumitomo Metal Industries, Ltd.**  
**1-3 Nishimaguro Amagasaki 660**  
**Japan**

**Hiroyuki Fukumoto**  
**Mechanical Engineering Laboratory**  
**Kobe Steel, Ltd.**  
**1-5-5 Takatsukada, Nishi-ku, Kobe**  
**651-22**  
**Japan**

**Akira Fukuzawa**  
**National Research Institute for Metals**  
**2-3-12 Nakameguro**  
**Mejiro-ku, Tokyo 133**  
**Japan**

**Takeshi Furuhashi**  
**Dept. of Elec. Meech. Eng.**  
**School of Engineering**  
**Nagoya University**  
**Euro-cho Chikusa-ku, Nagoya 464-01**  
**Japan**

**Dariusz Galka**  
**Institute of Fundamental**  
**Technological Research PAS**  
**Swietokrzyskp 21**  
**00-019 Warsaw**  
**Poland**

**Vadim Vladimirovich Gogosov**  
**Institute of Mechanics**  
**Moscow University**  
**Michurinsky Pr. 1 117192 Moscow**  
**USSR**

**Katsuhiro Goto**  
**R&D Center**  
**Iokai Rubber Industries**  
**3600 Kitatoyama Komaki, Aichi**  
**Japan**

**Ranjan Gupta**  
**Tokyo Denki Iokki Co., Ltd.**  
**1-31-1 Howcho, Nakano-ku, Tokyo**  
**164**  
**Japan**

**Song-Yop Hahn**  
**Dept. of Elec. Engineering**  
**Seoul Nat'l University**  
**Seoul 151-742**  
**Korea**

**Shikichi Hasama**  
**Faculty of Engineering**  
**Oita University**  
**700 Dannoharu, Oita 870-11**  
**Japan**

**Tsugmori Hasebe**  
**63-30, Yuhigaura**  
**Hiratsuka, Kanagawa 251**  
**Japan**

**Mitsuo Hashimoto**  
**Dept. of Electrical Engineering**  
**University of Industrial Technology**  
**4-1-1 Hashimotoodai,**  
**Sagamihara 229**  
**Japan**

**Hiroyuki Hashimoto**  
**Institute of Fluid Science**  
**Ishikawa University**  
**2-1-1 Katahira Sendai 980**  
**Japan**

**Hideyoshi Hashizume**  
**Faculty of Engineering**  
**Ishikawa University**  
**Aza Aobaku, Aramaki Aoba-ku,**  
**Sendai 980**  
**Japan**

**Yoshitaka Hayashi**  
**Research Institute of Electrical Comm.**  
**Ishikawa University**  
**2-1-1 Katahira, Aoba-ku, Sendai 980**  
**Japan**

**Zijad M. Hajnalar**  
**Elektrotehnicki Fakultet**  
**Universitet Zagreb**  
**Zagreb, Unska 3, 41000**  
**Yugoslavia**

**Shigeru Hemmi**  
**Century Research Center Corporation**  
**1-3-17 Nakase Chiba 261-01**  
**Japan**

**George Hermann**  
**Div. of Applied Mechanics,**  
**Durand Bldg.,**  
**Stanford University**  
**Stanford, CA 94305-4040**  
**USA**

**Joshiro Higuchi**  
**Institute of Industrial Science**  
**University of Tokyo**  
**7-22-1 Roppongi, Minato-ku, Tokyo**  
**106**  
**Japan**

**Iatsuo Hinata**  
**Elbari Research Co., Ltd.**  
**4-2-1 Honjusawa**  
**Utsunomiya, 351**  
**Japan**

**Wataru Hinoura**  
**Ishoku Electric Power Co., Inc.**  
**3-7-1 Ichibanecho**  
**Aoba-ku, Sendai 980**  
**Japan**

**Katsuhiko Hirata**  
**Evolution and Reliability Technology**  
**Center**  
**Matsushita Electric Works**  
**1048 Kadoma, Kadoma, Osaka**  
**Japan**

**Jiro Hokkyo**  
**Sony Magnetic Products Inc.**  
**3-4-1 Sakuragi, Eiga-jo, Miyagi 985**  
**Japan**

**Shuntaro Honma**  
**Governer of Miyagi Prefecture**  
**3-81 Honcho, Aoba-ku, Sendai 980**  
**Japan**

**Toshihisa Honma**  
**Department of Electrical Engineering**  
**Hokkaido University**  
**Nishi 8, Kita-ku, Sapporo-shi 060**  
**Japan**

Paul Ratnayake Polycar Hoole Dept. of Elec. & Elec. Eng., Faculty of Engineering University of Peradeniya Peradeniya Sri Lanka	Nathan Ida Electrical Engineering Dept. The University of Akron Akron OH 44325 USA	Hiroko Inoue Tokyo Denki Tokki Co., Ltd. 1-31-1 Honcho Nakano-ku, Tokyo 164 Japan
S. Ratnayakean H. Hoole Dept. of Engineering Harvey Mudd College Claremont CA 91711 USA	Yasushi Ido Dept. of Mech. Eng. Keio University 3-14-1 Hiyoshi, Kohoku-ku, Yokohama 223 Japan	Yukio Ishibashi Tokyo Inst. of Technology 2-12-1 Ookayama Meguro-ku, Tokyo Japan
Masayuki Horie Fuji Heavy Industries, Omiya Works Miyashima 1-9 Omiya Japan	Akira Idegawa Kawasaki Steel Corp. 1 Kawasaki-cho, Chiba 260 Japan	Yoshiyuki Ishihara Dept. of Electrical Engineering Doshisha University Kamigyo-ku, Kyoto 602 Japan
Tomoyoshi Horie Kyushu Institute of Technology 689-4 Kawaizu Izuka, Fukuoka 820 Japan	Hajime Igarashi Dept. of Electrical Engineering Faculty of Engineering Hokkaido University N 13, W 8, Kitaku, Sapporo 060 Japan	Hiroyuki Ishikawa Dept. of Elec. Mechanical Eng. School of Eng. Nagoya University Furo-cho, Chikusa-ku, Nagoya 464-01 Japan
Yoshinobu Hoshi Mechanical Engineering Laboratory Namiki 1-2 Tsukuba Ibaraki 305 Japan	Kiryu Igarashi Tohoku Electric Power Company 3-7-1 Ichibancho, Aoba-ku, Sendai 980 Japan	Noboru Isogai Japan Magnetic Bearing Co., Ltd. 3-1 Kameido, 6-chome, Koto-ku, Tokyo 136 Japan
Yoshiyuki Hosokawa Mechanical Engineering Laboratory 1-55 Iitatsukudai Nishishiku Kobe 651-22 Japan	Shinji Ikeda Japan Servo Co., Ltd. 3-93 Aioi-cho, Kiryu-shi, Gunma-ken, 376 Japan	Kazuhiko Iwai Faculty of Engineering Nagoya University Furo-cho, Chikusa-ku, Nagoya 464-01 Japan
R. K. T. Hsieh The Royal Institute of Technology S-100 44 Stockholm Sweden	Hideki Inagaki Toyota Central Res. & Develop. Labs., Inc. 41-1 Yokomichi, Nagakute Aichi-gun 480-11 Japan	Atsushi Iwanaga Tohoku Alps Furukawa Division 1 167 Aza Hasuda Nakazato Furukawa-shi, Miyagi-ken 989-61 Japan
Yoshitaka Ichii Dept. of Electrical Engineering Doshisha University Kamigyo-ku, Kyoto 602 Japan	Shosaku Inakatsu Kyokuto Becki Kaishha, Ltd. NI Park Bldg. 9-15, Futaba 2-chome, Shinagawa-ku, Tokyo 142 Japan	Balachandran Jeyadevan Akita University Tezata Gakuen-cho 1-1, Akita 010 Japan
Atsushi Ichikawa Railway Technical Research Institute 2-8-38 Hikari-cho, Kokubunji-shi, Tokyo 185 Japan	Hiroshi Inatomi Soken, Meidensha 2-1-17 Osaki Shinagawa, Tokyo 141 Japan	Z. W. Jiang Dept. of Mech. Engineering Tohoku University Aramaki, Aoba-ku, Sendai 980 Japan
Mizhuo Ida Ishikawajima-Harima Heavy Industries Co., Ltd. 5236 Kamio, Dejima-mura Niihari-gun, Ibaraki 300-01 Japan	Eryk Infeld Soltan Institute Hoza 69 00-681 Warsaw Poland	Hyun Kyo Jung Dept. of Elec. Engineering Kangwon Nat'l University Chuncheon 200-701 Korea
		Tomoyuki Jyoichi Nippon Seiko K. K. 1-6-3 Osaki Shinagawa-ku, Tokyo 141 Japan

<p><b>Yukio Kagawa</b> Dept. of Elec. &amp; Electro Engineering Okayama University Tsushima, Okayama, 700 Japan</p> <p><b>Koichiro Kamada</b> Tsukuba R&amp;D Laboratory OMRON Corporation 45 Wada, Tsukuba, Ibaraki 300-42 Japan</p> <p><b>Shinichi Kamiyama</b> Institute of Fluid Science Iohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan</p> <p><b>Mituru Kanamori</b> Maizuru College of Technology 231 Shiraya, Maizuru, Kyoto 625 Japan</p> <p><b>Shigehiko Kaneko</b> Eng. Res. Inst. Faculty of Engineering University of Tokyo 2-11-16 Yayoi, Bunkyo-ku, Tokyo 113 Japan</p> <p><b>Iakao Kanno</b> First Research Dept. Eng. Div. NOK Corporation 4-3-1 Tsujido-Shinmachi, - Fujisawa, Kanagawa 251 Japan</p> <p><b>Mitsuru Karita</b> Shinko Electric Co., Ltd. Research &amp; Develop. Lab. 100 Iakegahama, Ise 516 Japan</p> <p><b>Mitsuhiko Kashima</b> Jidousha Kenkyujo Kayaba Kogyo K. K. Kani, Gifu, Gifu 505 Japan</p> <p><b>Koji Kato</b> Faculty of Engineering Iohoku University Aramaki Azu Aoba, Aoba-ku, Sendai 980 Japan</p> <p><b>Yoji Kawamoto</b> Mitsubishi Heavy Industries, Ltd. 1-1 Akunoura-machi, Nagasaki 850-01 Japan</p>	<p><b>Kazunari Katagiri</b> The Institute of Fluid Science Iohoku University Katahira 2-1-1, Aoba-ku, Sendai 980 Japan</p> <p><b>Hiroshi Katoh</b> T-T-C, Inc. 2, Kanda Kitamorimonochō, Chiyoda- ku, Tokyo 101 Japan</p> <p><b>Shuhei Kawamura</b> The Institute of Fluid Science Iohoku University Katahira 2-1-1, Aoba-ku, Sendai 980 Japan</p> <p><b>Yoshihiro Kawase</b> Dept. of Electronics and Computer Engineering Gifu University 1-1 Yanagido, Gifu 501-11 Japan</p> <p><b>S. Kikkawa</b> The Institute of Fluid Science Iohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan</p> <p><b>Atsushi Kikuchi</b> Dept. of Metallurgy Faculty of Engineering Iohoku University Aza Aoba, Aramaki, Aoba-ku Sendai 980 Japan</p> <p><b>Haruhide Kikuchi</b> Dept. of Electronics and Computer Engineering Gifu University 1-1 Yanagido, Gifu 501-11 Japan</p> <p><b>Dept. Hiroshige Kikuchi of Mech. Eng.</b> Keio University 3-14-1 Hiyoshi, Kohoku-ku, Yokohama 223 Japan</p> <p><b>Akio Kimura</b> Hachinohe Institute of Technology 88-1 Ohbiraki, Myo, Hachinohe 031 Japan</p> <p><b>Yutaka Kishida</b> R&amp;D Laboratories-1 Nippon Steel Corp. 1618 Jdo Nakahara-ku, Kawasaki 221 Japan</p>	<p><b>Yoshihiro Kitada</b> Institute of Technology Shimizu Corporation 4-17 Ichijojima, 3-chome, Koto-ku, Tokyo 135 Japan</p> <p><b>Iwadashi Kitamura</b> Kyushu Institute of Technology 680-4 Kawazu, Izuka, Fukuoka 820 Japan</p> <p><b>Kenichi Kobayashi</b> Tsubakimoto Emerson Co., 7-5, 3-chome, Goryo Daito, Osaka 574 Japan</p> <p><b>Takashi Kobayashi</b> Hitachi Research Laboratory Hitachi, Ltd. 4026 Kujii-cho, Hitachi, Ibaraki 319-12 Japan</p> <p><b>Yuichi Kodaira</b> Sanyo Denki Co., Ltd. R&amp;D Division 6-41 Kamionki, Nishi 1-chome, Kawaguchi-shi, Saitama 333 Japan</p> <p><b>Takashi Koga</b> Toyo Electric Mfg. Co., Ltd. 338 Kamisohyagi, Yamato Kanagawa 242 Japan</p> <p><b>Kazuo Koike</b> Tohoku Gakuin University 13-1, Chou-1, Engajo Miyagi 985 Japan</p> <p><b>Hiroyuki Kojima</b> Faculty of Engineering Gunma University 1-5-1 Tenjin-cho, Kiryu, Gunma 376 Japan</p> <p><b>Haruyuki Komelani</b> Central Research Lab. Mitsubishi Electric Corp. 8-1-1 Tukaguchi-honmachi, Amagasaki 661 Japan</p> <p><b>Mochimitsu Komori</b> Kyushu Institute of Technology 680-4, Kawazu, Izuka, Fukuoka 820 Japan</p>
--	---	--

Ichishi Kosawada  
Dept. of Mechanical Eng.  
Faculty of Eng.  
Yamagata University  
4-3-16 Jyounan, Yonezawa 992  
Japan

Takafumi Koseki  
Masuda Lab., Dept. of Elec. Eng.  
The University of Tokyo  
Hongo, 7-3-1, Bunkyo-ku, Tokyo 113  
Japan

Kazuo Kosugo  
The Institute of Fluid Science  
Tohoku University  
2-1-1 Katahira, Aoba-ku, Sendai 980  
Japan

Romuald Kazimierz Kotowski  
Institute of Fundamental Technological  
Research  
Swietokrzyska 21  
00-049 Warsaw  
Poland

Andrzej Krawczyk  
Institute of Electrical Engineering  
Poznanskiego 27,  
04-703 Warsaw  
Poland

Yoshimasa Kuji  
Ishimura Pump Mfg. Co., Ltd.  
Sendai Office  
2-2-1, Chyu-oh, Aoba-ku, Sendai 980  
Japan

Koichi Kurita  
Sumimoto Metal Industries, Ltd.  
16, Sunayama, Hasukimachi  
Kashimagan, Ibaraki 314-02  
Japan

Yutaka Kurita  
Shinko Electric Co., Ltd.  
Research & Develop. Lab.  
100 Takegihama, Ise 516  
Japan

A. Kuroda  
Iron & Steel Research Lab.  
Sumimoto Metal Industries, Ltd.  
16 Sunayama Hazaki-cho, Ibaraki  
314-02  
Japan

Akio Kuromiya  
Gasoline Injection Eng. Dept.  
Nippondenso Co., Ltd.  
1-1 Showa-cho, Kariya, Aichi  
Japan

Byung Il Kwon  
Dept. of Electrical Engineering  
Waseda University  
3-4-1 Ohkubo, Shinjuku-ku, Tokyo  
169  
Japan

Ki-Sik Lee  
Dept. of Electrical Engineering  
Kankook University Seoul,  
Korea

Guy Pierre Lemarquand  
LSM Université de Savoie  
BP240 Annecy le Vieux 74942  
France

Furter, R. W. Lenz  
Institute für Theoretische Mechanik  
Universität  
Kaiserstr. 12 D7500 Karlsruhe 1  
FRG

Yu-Zhou Liu  
The Institute of Fluid Science  
Tohoku University  
2-1-1 Katahira, Aoba-ku, Sendai 980  
Japan

Guo-Rong Liu  
The Institute of Fluid Science  
Tohoku University  
2-1-1 Katahira, Aoba-ku, Sendai 980  
Japan

Masataka Maeda  
Century Research Center Corporation  
3-6-2 Nihonbashi-Honcho  
Chuo-ku, Tokyo  
Japan

Hideaki Maeda  
Toshiba R&D Center  
Toshiba Corporation  
4-1 Uchisima, Kawasaki-ku,  
Kawasaki, Kanagawa 210  
Japan

Yutaka Mackawa  
Mitsubishi Heavy Industries, Ltd.  
1-1 Wadasaki, 1-chome  
Hyogo, Kobe  
Japan

Hiroshi Makino  
NFC Corporation  
1-1 Miyazaki 4-chome  
Mayamae-ku, Kawasaki, Kanagawa 213  
Japan

Tsunehiro Maruo  
Sony Corp.,  
Component Development Group  
6-7-35 Kitashinagawa  
Shinagawa-ku, Tokyo  
Japan  
Bogdan Maruszewski  
Technical University of Poznan  
Inst. of Appl. Mechanics  
ul. Piotrowo 3, 60-965 Poznan  
Poland

Shigenao Maruyama  
The Institute of Fluid Science  
Tohoku University  
Katahira 2-1-1, Aoba-ku, Sendai 980  
Japan

Eisuke Masuda  
Dept. of Electrical Engineering  
The University of Tokyo  
3-1 Hongo 7, Bunkyo-ku, Tokyo 113  
Japan

Shigehiro Matsuda  
The Institute of Fluid Science  
Tohoku University  
2-1-1 Katahira, Aoba-ku, Sendai 980  
Japan

Hirotoshi Matsuki  
Dept. of Electrical Engineering  
Tohoku University  
Aoba-Aramaki, Aoba-ku, Sendai 980  
Japan

Kiyoshi Matsumoto  
Superconducting & Cryogenic  
Technology Center  
Kobe Steel, Ltd.  
1-5-5 Bikatsukadai, Nishi-ku, Kobe  
651-22  
Japan

Eiji Matsumoto  
Department of Mechanical Engineering,  
Kyoto University,  
Yoshida-Honmachi, Sakyo-ku, Kyoto  
606  
Japan

Fumio Matsumura  
Faculty of Engineering  
Kanazawa University  
2-40-20 Kodatsuno, Kanazawa 920  
Japan

Osami Matsushita  
Isuchium Works, Iimachi, Ltd.  
502 Kondatsu, Isuchium,  
Ibaraki 300  
Japan

<b>Gerard A. Maugin</b> Lab. Modélisation en Mécanique Univ. Pierre et Marie Curie Tour 66, 4 place Jussieu, Paris Cedex 05 75252 France	<b>Takayuki Moriyama</b> The Institute of Fluid Science Tohoku University Katahira 2-1-1, Aoba-ku, Sendai 980 Japan	<b>Shigeyuki Nakada</b> Tamano Laboratory Mitsui Eng & Shipbuilding 3-16-1 Tamahara, Tamono City, Okayama 706 Japan
<b>Wolfgang Menz</b> Institute für Mikrostrukturtechnik, Kernforschungszentrum Karlsruhe GmbH, P.O.Box 3640 W- 7500 FRG	<b>Takashi Moriyama</b> 2-3-3 Uozaki-Nishi, Higashishi-Nada, Kobe, Hyogo 658 Japan	<b>Takayoshi Nakata</b> Dept. of Electrical Engineering Okayama University Tsushima Okayama 700 Japan
<b>Sitiro Minagawa</b> The University of Electro- Communications Chofu, Tokyo 182 Japan	<b>Akira Motoe</b> R&D Center, Toshiba Corporation 4-1, Ushimura-cho, Kawasaki-ku, Kawasaki 210 Japan	<b>Masaya Nakatani</b> Matsushita Electronic Components Co., Ltd. 1006 Kadoma, Osaka 571 Japan
<b>Hirofumi Miura</b> Dept. of Mechanical Engineering The University of Tokyo 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 Japan	<b>Viorel Munteanu</b> I.C.P.P.A.M Jalali Magistrala CSG, 2, Galati 6200 Romania	<b>Katsuji Nakatsuka</b> Faculty of Engineering, Tohoku University Aramaki Aza Aoba Aoba-ku, Sendai 980 Japan
<b>Kenzo Miya</b> Nuclear Engineering Research Laboratory University of Tokyo 22-2 Shirane Shirakata, Tokai, Naka- gun Ibaraki Japan	<b>Yasunori Murakami</b> Dept. of Electronics and Computer Engineering, Gifu University 1-1 Yanagido, Gifu 501-11 Japan	<b>Iakeshi Nakaya</b> 12-3, 2-Chome, Kasagami, Iwajio Miyagi-ken 985 Japan
<b>Hidesuke Miyairi</b> Sony Magnetic Products Inc. 3-4-1 Sakuragi Tagajo, Miyagi 985 Japan	<b>Carlos Shinichi Muranaka</b> Res. Inst. Elect. Comm Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan	<b>Kenichi Nanbu</b> Institute of Fluid Science Tohoku University Katahira 2-1-1, Aoba-ku, Sendai 980 Japan
<b>Yoshiharu Mohri</b> Mechanical Engineering Research Lab. Hitachi Ltd. 502 Kandatsumachi Tsuchiurashi, Ibaraki 300 Japan	<b>Masao Nagai</b> Tokyo Univ. of Agriculture and Technology Koganei, Naka, 2-24-16, Tokyo Japan	<b>Masaaki Nemoto</b> Mitsubishi Heavy Industries, Ltd. 1-1, Akunoura-machi, Nagasaki 850- 91 Japan
<b>Teruo Mori</b> Magnetic Materials Center. TDK Corporation 570-2, Aza-Matsugashita, Minamihatori, Narita, Chiba, 286 Japan	<b>Bunshu Nagai</b> School of Engineering Ibaraki University 4-12-1 Nakanarusawa, Hitachi, 316 Japan	<b>Seisuo Niikura</b> Mitsubishi Atomic Power Industries, Inc. 4-1, Shibakouen 2-chome, Minato-ku, Tokyo 105 Japan
<b>Ebadashi Morita</b> Fuji Electric Corporate Res. and Develop., Ltd. 7 Yawata-Kaigandori, Ichihara, Chiba 290 Japan	<b>Shoichiro Nagata</b> Faculty of Engineering, Oita University 700 Dannoharu, Oita 870-11 Japan	<b>Jorgen L.Nikolajsen</b> Texas A&M University 8600 Topaz Court, College Station, Texas 77845 USA
<b>Yoshiyasu Morita</b> Sumitomo Metal Industries, Ltd. 1-8 Fusou-chou, Amagasaki 660 Japan	<b>Kosuke Nagaya</b> Dept. Mech. Engineering Gunma University Kiryu, Gunma, 376 Japan	<b>Norihiko Ninomiya</b> Nichicon Corporation 2-3-1 Yagura, Kasatsu 525 Japan

Eiji Nishiyama Fuji Electric Corporation 1-12-1 Yurakucho, Chiyoda-ku, Tokyo 100 Japan	Yoshi Ohba Kyokuto Boeki Kaisha, Ltd. N1 Park Bldg. 9-15, Futaba 2-chome, Shinagawa-ku, Tokyo 142 Japan	Masaaki Ohkubo Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan
Hideya Nishiyama The Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan	Yasuharu Ohdachi Toyota Central Res. & Develop.Labs., Inc. 41-1, Aza Yokomichi, Oaza Nagakute Nagakute, Aichi-gun, Aichi- ken 480-11 Japan	Isamu Okuzawa Mechanical Engineering Research Laboratory Hitachi, Ltd. 3-1-1 Sawai, Hitachi Ibaraki 317 Japan
Junichi Nishizawa President of Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan	Kenichiro Ohmata School of Science and Technology Meiji University 1-1-1 Higashimita, Tama-ku, Kawasaki, 214 Japan	Shuzo Oshima Tokyo Institute of Technology Ookayama 2-12-1, Meguro-ku, Tokyo 152 Japan
Kazukuni Noguchi Ono Sokki Co., Ltd. Shinjuku NS Bldg., 2-4-1 Nishishinjuku, Shinjuku-ku, Tokyo 163 Japan	Hiroyuki Ohsaki Dept. of Electrical Eng., The University of Tokyo 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 Japan	Ioshiyuki Otake Kyokuto Boeki Kaisha, Ltd. N1 Park Bldg. 9-15, Futaba 2-chome, Shinagawa-ku, Tokyo 142 Japan
Youichi Nojima Century Research Center Corporation 1-3-D17 Nakase, Chibashi, Chiba Japan	Fukuo Ohta The Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan	Tadamasa Oyama Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan
Kenzo Nonami Faculty of Engineering, Chiba University 1-33, Yayoi-cho, Chiba 260 Japan	Kikuo Ohmoto The Institute of Fluid Science Tohoku University Katahira 2-1-1, Aoba-ku, Sendai 980 Japan	Aurelui Panaitescu Polytechnic Institute of Bucharest Electrical Eng. Dept. Spl. Independentei 313, Bucharest 77206 Romania
Yukio Nose Yaskawa Electric Mfg. Co., Ltd. 2346 Fijita, Yahata-Nishi, Kitakyushu 806 Japan	Shunichi Oikawa Dept. of Nuclear Engineering Hokkaido University N-13, W-8, Kita-ku, Sapporo 060 Japan	Vladimir Z. Parton Dept. of Mathemat. Moscow Inst of Chem. Eng. 21/4, K.Marx Street, Moscow , B-66 107884 USSR
Jerzy Pawel Nowacki IFTR PAS Swietokrzyska 21, 00-049 Warsaw Poland	Yohji Okada School of Engineering Ibaraki University 4-12-1 Nakanarusawa, Hitachi 316 Japan	Zbigniew Peradzynski Institute of Fundamental Technological Research Swietokrzyska 21 00-049 Warsaw Poland
Riki Oogawa Superconducting & Cryogenic Technology Center Kobe Steel, Ltd. 1-5-5, Takatsukadai, Nishi-ku Kobe 651-22 Japan	Shinzou Okada Hiratsuka Research Laboratory Sumitomo Heavy Ind., Ltd. 63-30, Yuhigoka, Kanagawa 254 Japan	Albert P. Pisano Dept. of Mech. Eng. University of California 5126 Etcheverry Berkeley, CA 94720 USA
Kuniomi Oguchi Ibaraki University 4-12-1 Nakanarusawa, Hitachi 316 Japan	Shigeo Okamoto TDK Corporation 570-2 Aza-Matsugashita, Minamihatori, Narita, Chiba, 286 Japan	Yuri I. Raikher Institute of Continuous Media Mechanics 1 Korolyov St. Penn 614061 USSR
Akihito Ohba Century Research Center Corporation 1-3-D17 Nakase, Chiba 261-01 Japan		

Nelli Nikolayevna Rogacheva Institute for Problems in Mechanics USSR Academy of Sciences Prosper Vernadskogo 101, Moscow B- 526 117526 USSR	Yujirō Sakamoto Mechanical Engineering Laboratory Kobe Steel, Ltd. 1-5-5 Tatsukashidai, Nishi- ku, Kobe 651-22 Japan	Iakeshi Sato The Institute of Fluid Science Tohoku University 2-1-1 Katahira Aoba-ku, Sendai 980 Japan
Nanjundappa Rudriah Vice-Chancellor, Gulbarga University Gulbarga(Karnataka) 585 106 India	Tetsuzo Sakamoto Dept. of Control Eng. Kyushu Inst.of Technology Inobata, Kitakyushu 804 Japan	Yoshibiro Sato The Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan
Czeslaw Rymarz Inst. of Fundamental Technological Research ul. Swietokrzyska 21 Warsaw 00-049 Poland	Haruo Sakamoto Sumitomo Metal Industries, Ltd. Osaka Steel Works 5-1-109 Shimizuyama, Konohama, Osaka 554 Japan	Kazuo Sato Heavy Apparatus Eng. Lab. Toshiba Corporation 2-4 Suehiro-cho, Kurumi-ku, Yokohama, Kanagawa 230 Japan
Iomohiko Sada 1250-8 Kamiochiai, Yono, Saitama Japan	Shinichi Sakuma Dept. of Mech. Engr. Tohoku University Sendai 980 Japan	Pierre Savary Nippon LFM K.K. 1-8-14 Nishimiyama, Yodogawa-ku, Osaka 532 Japan
Muneharu Saigoh Mechanical Engineering Lab. AIST, MIIL Namiki 1-2, Tsukuba, Ibaraki 305 Japan	Mitsuru Sakurai Kawasaki Steel Corp. Chiba Works 1, Kawasaki-cho, Chiba 260 Japan	Tatsuo Sawada Dept. of Mech. Eng. Keio University 3-14-1 Hiyoshi, Kohoku-ku Yokohama 223 Japan
Yoshifuru Saito College of Engineering Hosei University 3-9-2 Kajino, Koganei, Tokyo 184 Japan	Hideo Katome Fuji Electric Corp. R&D Ltd. Hirai, Hino, Tokyo 191 Japan	Kazuto Seto Dept. of Mechanical Engineering National Defense Academy 1-10-20 Hashirimizu, Yokosuka 239 Japan
Shinobu Saito Research Institute, III 3-1-15, Toyosu, Kotoku, Tokyo Japan	Takashi Sasakawa Railway Technical Research Institute 2-8-38 Hikari-cho, Kokubunji, Tokyo 185 Japan	Motoaki Shibayama Shikoku Research Institute Inc. Yashima Nishi, Takamatsu 761-01 Japan
Akinori Saito Toyota Central Res. & Develop. Labs., Inc. 41-1 Aza Yokomichi, Otsu Nagakute, Nagakute, Aichi-gun, Aichi 480-11 Japan	Hisaya Sasamoto Hitachi Research Labo., Hitachi Ltd. 1-1-Saiwai-cho, 3-chome, Hitachi, Ibaraki 317 Japan	Kuniro Shimada The Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan
Ioshio Saitoh Hitachi Research Laboratory, Hitachi, Ltd. 1-1 Saiwai-cho, 3-chome, Hitachi-shi, Ibaraki 317 Japan	Syutti Sato Nippon Steel Corp. 1-1-1-chome Iidamitsu, Yawata- Higashi-ku, Kitakyushu 805 Japan	Eiro Shimogo Dept. of Mechanical Engineering Keio University 3-14-1-hiyoshi, Kohoku-ku, Yokohama 223 Japan
Kanji Sakai Obayashi Corporation 2-3 Kanda Tsukasa-cho, Chiyoda-ku, Tokyo 101 Japan	Takehiko Sato The Institute of Fluid Science Tohoku University 2-1-1 Katahira Aoba-ku, Sendai 980 Japan	Pan Seok Shin Korea Electrotechnology Research Institute KIRI, Pob no.20, Chang Won 641-120 Korea

Yasuhiko Shindo Faculty of Eng., Tohoku University Aramaki-Aza-Aoba, Aoba-ku, Sendai 980 Japan	Yushi Sun Dept. of Automatic control Nanjing Aero. Inst Nanjing Jiangsu 210016 PRC	Koichi Iakeda R&D Laboratories-1, Nippon Steel Corp. 1618 Iida, Nakahara-ku, Kawasaki 211 Japan
Yotaka Shingu Kyokuto Boueki Kaisha, Ltd. NI Park Bldg. 9-15, Tsurumi 2-chome, Shinagawa, Tokyo 142 Japan	Tatsuya Suzuki Kawasaki Heavy Industries, Ltd. 4-25, 2-chome, Minamisuna, Koto-ku Tokyo 136 Japan	Kenji Takemura Tsukuba R&D Laboratory OMRON Corporation 45 Wadai, Tsukuba, Ibaraki 300-42 Japan
Kazuhito Shintani The University of Electro- Communications 1-5-1 Chofugaoka, Chofu, Tokyo 182 Japan	Katsuyoshi Suzuki Faculty of Engineering, Yamagata University 4-3-16 Iyonan, Yonezawa 992 Japan	Hideyuki Tamura Faculty of Eng., Kyushu University 6-10-1 Hikozakim, Higashi-ku, Fukuoka 812 Japan
Ietsuo Shoji Res. Inst. for Fractures Tohoku University Aramaki-Aoba-ku, Sendai 980 Japan	Etsushi Iida Faculty of Eng. Sci., Osaka University 1-1 Machikaneyama, Itoyonaka, Osaka 560 Japan	Iakahiko Iinahashi Dept. of Mech. Eng., Keio University 3-14-1 Hiyoshi, Kohoku-ku, Yokohama 223 Japan
Yoshinori Shoji The Institute of Fluid Science Tohoku University 2-1-1 Katahira Aoba-ku, Sendai 980 Japan	Sadakazu Takada Torima Pump MFG Co., Ltd 1-1-8 Miyata-cho, Takatsuki, Osaka 569 Japan	Iwatomu Tanaka Iron & Steel Research Lab., Sumitomo Metal Ind., Ltd 16 Sunayama, Hasaki, Itami 214 Japan
Ryszard Sikora EE Dept. Technical University of Szczecin Al. Piastow 19 Szczecin 70-310 Poland	Ioshiyuki Takagi The Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan	Yoshifumi Tanaka Century Research Center Corporation 2-1, Kyutaro, 4-chome, eyo-ku, Osaka 541 Japan
Ideusz P. Skoczkowski EE Dept. Silesian Technical University B. Krzywoustego 2, Gliwice 44-110 Poland	Iakao Takahashi Hitachi Research Laboratory Hitachi Ltd., 4026 Kuji-cho, Hitachi-shi, 319-12 Japan	Junji Tani The Institute of Fluid Science Tohoku University 2-1-1 Katahira Aoba-ku, Sendai 980 Japan
Etsushi Sonoi Mechanical Engineering Laboratory 1-5-5 Takatsukadai, Nishiku, Kobe 651-22 Japan	Ryoichi Takahata R&D Center Koyo Seiko Co., Ltd. 24-1 Kokubuhiganjyo, Kashiwara, Osaka 582 Japan	Koji Tanida Ishikawajima-Harima Heavy Industries Co., Ltd. 1-Shinnakahara, Isogo, Yokohama 235 Japan
Yuzuru Sudani The Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan	Etsuo Take Fuji Electric corporate Res. & Develop. Ltd. 7 Yawata-Kaigandori Ichihara, Chiba 290 Japan	Shoji Taniguchi Dept. of Metallurgy, Faculty of Eng., Tohoku University Aza Aoba, Aramaki, Aoba-ku, Sendai 980 Japan
Senichi Sudo Institute of Fluid Science Tohoku University 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan	Hiroyo Iakeda Gasoline Injection Eng. Dept. Nippondenso Co., Ltd. 1-1 Showa, Kariya, Aichi Japan	Kunitoshi Izumie Dept. of Electronics Kyushu University Fukuoka 812 Japan
Yujirō Sogano Sendai Convention Bureau 2-16-12 Honcho, Aoba-ku, Sendai 980 Japan		

Junichi Teraki CAE Center, Daikin Industries, Ltd. 1304 Kanaokacho, Sakai 591 Japan	Larry R. Turner Argonne National Lab. Bldg 362, Argonne IL 60439 USA	Eiki Watanabe Mitsubishi Elec. Corp., Inazawa Works 1-Hishi Machi, Inazawa, Aichi Japan
Yoshiki Terashima Tsubakimoto Emerson Co., 7-5, 3-chome, Goryo, Daito, Osaka 574 Japan	Yoshiki Uchikawa School of Engineering Nagoya University Euro-cho, Chikusa-ku, Nagoya 464-01 Japan	Tomokuni Wauke Furukawa Division 1 167 Aza Hasuda Nakazato, Furukawa Miagi 989-61 Japan
Eikashi Ipdaka Faculty of Engineering Oita University 700 Dannoharu, Oita 870-11 Japan	Kenji Uchino Department of Physics Sophia University Kioi-cho 7-1, Chiyoda-ku, Tokyo 102 Japan	Kenji Yagi Dept. of Electrical Eng. Waseda University 3-4-1 Ohkubo, Shinjuku-ku, Tokyo 169 Japan
Iadashirikumatsu Heavy Apparatus Eng. Lab. Toshiba Corporation 2-4 Suehiro, Tsurumi, Yokohama, Kanagawa 230 Japan	Shogo Ueno Dept. of Electronics Kyushu University 6-10-1 Hakozaki, Higashi-ku, Fukuoka 812 Japan	Yasuhiro Yamada Nuclear Engineering Research Lab. The University of Tokyo 22-2 Shirane Strakata, Tokai, Naka, Ibaraki 319-11 Japan
Yoshiro Tomikawa Dept. of Electrical & Information Eng. Yamagata University 4-3-6 Johnan, Yonezawa, Yamagata 992 Japan	Noritsugu Umehara Faculty of Engineering Tohoku University Aramaki-aza-Aoba, Aoba-ku, Sendai 980 Japan	Takayuki Yamada NTT Transmission Systems Laboratories Iku-mura, Naka-gun, Ibaraki-ken 319-11 Japan
Naoko Tomimori Mechanical Engineering Laboratory Hitachi Ltd. 502 Kandatsumachi Tsuchiura, Ibaraki 300 Japan	Masami Urata Toshiba R&D Center Toshiba Corporation 4-1 Ushimura, Kawasaki-ku, Kawasaki, Kanagawa 210 Japan	Masatoshi Yamada Toyota Central Res. & Develop. Lab., Inc. 41-1 Aza Yokomichi, Otsu Nagakute- cho, Aichi-gun, Aichi 480-11 Japan
William Stuart Trimmer Belle Mead Research, Inc. 58 Riverview Terrace, Belle Mead, N.J. 08502 USA	Hiroki Usuda The Institute of Fluid Science Tohoku University Katahira 2-1-1, Aoba-ku, Sendai 980 Japan	Natsue Yamamoto Kyokuto Boueki Kaisha, Ltd. NI Park Bldg. 9-15 Futaba 2-chome, Shinagawa-ku, Tokyo 142 Japan
Masanori Tsuchimoto Nuclear Engineering Research Lab. University of Tokyo 22-2 Shirane Strakata, Tokaimura, Naka Ibaraki 319-11 Japan	Tamaz S. Vashakmadze Vekua Institute of Applied Mathematics Tbilisi State University University St. 2, Tbilisi 380043 USSR	Eidanori Yamamoto Yunsa 2-3-21, Kosobecho, Takatsuki, Osaka 569 Japan
Chihiro Tsukishima Mitsubishi Electric Co. 1-1 Sukaguchi-Honmachi, 8-chome, Amagasaki, Hyogo 661 Japan	Iakeshi Wada Century Research Center Corp. 1-3-D17 Nakase, Chiba Chiba Japan	Hirotoshi Yamamoto Shin Meiwa Industry Co., Ltd. 6-107 Iijikano-cho, Nishinomiya, Hyogo 663 Japan
Katsuji Tsurumoto Dep. of Mech. Engng. Tohoku Gakuen University 1-13-1 Chuo, Ibigajo, Miyagi 985 Japan	Iehiro Warabioka Institute of Fluid Science Tohoku University Katahira 2-1-1, Aoba-ku, Sendai 980 Japan	Hirokazu Yamamoto First Research Dept. Eng. Div., NOK Corporation 4-3-1 Tsujido-Shinmachi, Fujisawa, Kanagawa 251 Japan