

Contents

Preface	ix
I. ELECTROMAGNETOSOLID MECHANICS	1
Coupled Magnetomechanical and Electromechanical Hysteresis Effects* <i>G.A. Maugin</i>	3
Analogy between Equations of Generalized Dynamic Thermoelasticity and Equations of Electrodynamics <i>R. Wojnar</i>	19
Dynamic Behavior of Flawed Thin Plates under Time-Varying Magnetic Field <i>J. Tani, M. Minagawa and K. Ohtomo</i>	25
Singular Moments in a Cracked Soft Ferromagnetic Plate under Bending <i>Y. Shindo and K. Horiguchi</i>	35
Magnetic Field and Stress Analysis for a Ferromagnetic Material <i>T. Takagi, T. Oohira and K. Miya</i>	47
II. APPLIED ELECTROMAGNETICS IN FREE ELECTRON LASERS	59
Overview of the Accelerators for Free Electron Laser Oscillators and the Design Consideration on the JAERI Superconducting LINAC* <i>Y. Kawarasaki</i>	61
Higher Harmonics Operation of UT/NERL Free-Electron Laser <i>H. Ohashi, R. Hajima, H. Kobayashi and S. Kondo</i>	71
Spectral Characteristics of Free-Electron Lasers <i>R. Hajima, H. Ohashi and S. Kondo</i>	81
Generation and Resonance Absorption of Doppler Shift Dominated Cyclotron Maser Radiation by an Intense Relativistic Electron Beam <i>S. Kawasaki</i>	91
Design of the Beam Line for FEL Experiment <i>S. Nakata and C. Tsukishima</i>	103

*Invited paper.

III. APPLICATION OF ELECTROMAGNETIC FORCE AND PHENOMENA	115
Developments in the Numerical Modeling of NDT Phenomena* <i>W. Lord</i>	117
An Application of Electromagnetic Phenomena to Inverse Problem for Defect Shape Recognition* <i>K. Miya, Y. Iwamura and M. Hashimoto</i>	127
Interpretation of Seafloor Electromagnetic Data in Applied Geophysics <i>M. E. Everett, R. N. Edwards, S. J. Cheesman, H. Uiada and I. J. Ferguson</i>	143
Study of Remote Field Eddy Current Technique by Use of Poynting Vector <i>H. Hoshikawa, H. Saitou, J. Koido and Y. Ishibashi</i>	155
Estimation of Magnetic Reluctivity by the Finite Element Method and Analysis of the Error <i>S. Yamada and K. Bessho</i>	167
Numerical Analysis of an Annular Electromagnetic Flow Coupler <i>T. Takuma, K. Takenaka, K. Nemoto and H. Yasuda</i>	179
Electromagnetic Phenomena on Guideway Structures of Magnetic Levitation <i>A. Yamasita</i>	191
Applications of the Electromagnetic Force to Steel Making Processes <i>T. Kataoka, T. Nasada and Y. Yoneyama</i>	197
IV. NEW APPROACHES IN EDDY CURRENT ANALYSIS	209
The Computation of Eddy-Currents in Deformable Conductors* <i>A. Bossavit</i>	211
Three Dimensional Eddy Current Calculation Using Edge Elements for Magnetic Vector Potential <i>A. Kameari</i>	225
Finite Element Solution of Open Boundary Eddy Current Problems <i>Y. Saito, K. Takahashi and S. Hayano</i>	237
Discussion about Analysis of Magnetic Field Containing Moving Conductive Media <i>S. Hasebe and Y. Kano</i>	249

Distribution of the Scalar Potential and its Role in 3-D Eddy Current Problems <i>T. Yoshimoto, S. Yamada and K. Bessho</i>	261
Faster Eddy Current Computation Using Voronoi-Delaunay Transformation <i>Y. Saito, S. Ikeguchi and S. Hayano</i>	271
V. MICROMECHANICS IN ELECTROMAGNETIC FIELDS	283
Conductive Polymers as Material Multipole Composites* <i>R. K. T. Hsieh</i>	285
Micromechanics of Materials with Piezoelectric Effect Dislocations in Dielectrics* <i>J. P. Nowacki</i>	295
Transmission Loss of Electromagnetic Wave in Deformed Optical Fibres <i>S. A. Zhou, L. Koszegi, J. Bjorkman and T. Svensson</i>	305
Paraelastic and Paraelectric Phenomena in Crystals <i>J. Kapelewski</i>	317
Magnetic Field and Annealing Temperature Dependences of the Elasticity Moduli of the Iron Rich Metallic Glass Strips <i>Z. Kaczkowski</i>	325
Analysis of Electric Fields due to a Moving Dislocation Loop in Anisotropic Piezoelectric Crystals <i>K. Shintani and S. Minagawa</i>	337
VI. APPLIED ELECTROMAGNETICS IN SUPERCONDUCTING MATERIALS	345
Mechanical Characteristics of High Temperature Ceramic Superconductors* <i>E. S. Bobrov</i>	347
Preparation and Characterization of Highly Oriented Bi-Sr-Ca-Cu-O Superconducting Thin Films by Ion Beam Sputtering <i>K. Yoshimura, H. Kuwahara and S. Tanemura</i>	361
International Steering Committee	373
Author Index	375