Advanced Computer Techniques in Applied Electromagnetics

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The contributions in this publication on electromagnetic fields in electrical engineering aim at joining theory and practice, thus the majority of the papers are deeply rooted in engineering problems and simultaneously present a high theoretical level.

There are three chapters in this volume, all divided into seven subchapters. Papers gathered in the first chapter are mainly devoted to physics of electromagnetic materials and mathematical approaches to electromagnetic problems. The next chapter contains papers dealing with numerical (or computer) analysis of electromagnetic devices and phenomena, whereas the last chapter reveals the world of engineering problems, showing how theoretical and methodological considerations can be transferred to real engineering problems. The editors hope that this book will help the world-wide electromagnetic community, both academic and engineering, in better understanding electromagnetism itself and its application to technical problems.
Contents:
(First fifteen chapters)

Fundamental Problems
- Power Effect in Magnetic Lamination Taking into Account Elliptical Hysteresis Approach/ K. Zakrzewski
- Study of Electromagnetic Field Properties in the Neighborhood of the Metallic Corners/ S. Apanasewicz and S. Pawlowski
- Eddy Currents and Lorentz Forces in Pulsed Magnetic Forming/ J. Albert, W. Hafla, A. Buchau and W.M. Rucker
- Applicability of Microwave Frequencies to the Evaluation of Deeper Defects in Metals/ D. Faktorová
- Electromagnetic Field Energy in Ferromagnetic Barriers/ R. Niedbala, D. Kucharski and M. Wesolowski
- The Influence of Temperature on Mechanical Properties of Dielectromagnetics/ B. Slusarek, P. Gawrys and M. Przybylski
- Influence of the Magnetic Anisotropy on Electrical Machines/ M. Herranz Gracia and K. Hameyer
- Analysis of Structural Deformation and Vibration of Electrical Steel Sheet by Using Magnetic Properties of Magnetostriction/ W. Kitagawa, K. Fujiwara, Y. Ishihara and T. Todaka

Methods
- Application of Logarithmic Potential to Electromagnetic Field Calculation in Convex Bars/ S. Apanasewicz
- Very Fast and Easy to Compute Analytical Model of the Magnetic Field in Induction Machines with Distributed Winding/ M. Pineda, J. Roger Folch, J. Perez and R. Puche
- Coupling Thermal Radiation to an Inductive Heating Computation/ C. Scheiblich, K. Frenner, W. Hafla and W.M. Rucker
- Consideration of Coupling between Electromagnetic and Thermal Fields in Electrodynamic Computation of Heavy-Current Electric Equipment/ K. Bednarek
- Force Computation with the Integral Equation Method/ W. Hafla, A. Buchaua and W.M. Rucker

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