

## <<电磁场与电磁波>>

### 图书基本信息

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### 前言

This is an English translation of the textbook "Electromagnetic fields and electromagnetic waves", written by Rugui Yang and published by Higher Education Press in 2003. The initial translation was conducted by Robert R. G. Yang. Further re-view and revision of the translation was performed by Thomas T. Y. Wong. Professor Yang is with Southwest Jiaotong University of China, where he was the director of the Electromagnetics Institute. Professor Wong is with the Illinois Institute of Technology ( IIT ) in USA, where he is the director of the Microwave Laboratory and the chair-man of the Electrical and Computer Engineering Department at IIT. To facilitate bilingual teaching and learning, much effort has been devoted to preserving the original syntax as well as the style of presentation vested in the Chinese text, while being mindful of the intrinsic differences between the two languages. The assistance in word processing provided by Ming Yan and Feng Gao, both doctoral students in electrical engineering at IIT, has been a significant contribution to the preparation of the revised manuscript. Questions and comments on this book will be much appreciated. Readers are encouraged to visit the Website at <http://lxy.swjtu.edu.cn/emi/books/emfw/emfw.asp>.

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### 内容概要

This is a university-level textbook on electromagnetic fields and waves for undergraduate programs in electronic and information engineering, focusing on the basic properties of electromagnetic fields and waves, with emphasis on time-varying fields. With the rapid development of information technology, a thorough understanding of and familiarity with the properties of electromagnetic fields and waves, along with the relevant analytical tools and practical applications are expected for professionals working in the field of information technology. A course on electromagnetics is therefore an important part of the curriculum that forms the essential knowledge base for undergraduates majoring in information technology and electronic engineering.

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## 作者简介

作者：杨儒贵 (美国) 汤姆斯 (Thomas.T.Y.) Robert R.G. Yang was graduated from Department of Radio Engineering, Xi'an Jiaotong University. He was teaching assistant, lecturer, associate professor of Xi'an Jiaotong University, and the director of Electromagnetics Institute of Southwest Jiaotong University. Currently, he is professor and Ph.D. adviser of Southwest Jiaotong University. Professor Yang ever worked in the famous University of Illinois at Urbana-Champaign, USA, for six years.

After graduation, he is engaged in teaching and research on electromagnetic theory, antenna theory and design, and satellite positioning and communication. He has been responsible for several national projects regarding mobile communication antennas, satellite positioning antennas, electromagnetic scattering, analysis and synthesis of cylindrical antenna array, and microwave observable materials. Recently, he published tens of papers in the domestic and International academic periodicals and conferences. Professor Yang has been on the teaching works for undergraduates and graduates. He authored "Electromagnetic Fields and Waves" (Xi'an Jiaotong University Press, 1989), "Auxiliary Functions in Electromagnetic Theory" (Higher Education Press, 1992), "Electromagnetic Theorems and Principles" (Southwest Jiaotong University Press, 2002), and "Electromagnetic Fields and Electromagnetic Waves" (Higher Education Press, 2003). In addition, he coauthored "Electromagnetic Theory" (Xi'an Jiaotong University Press, 1991) with Dazhang Chen and Pengcheng Liu. During his work in University of Illinois at Urbana-Champaign, he owned the patents of the compact and stacked microstrip antennas, and won the best paper award about GPS antenna from Institute of Navigation, USA. Professor Yang also won the honors of the Distinguish Teacher and the Excellent Teaching from Xi'an Jiaotong University, the awards of Hongyu Distinguish Teacher from Southwest Jiaotong University, and The Scientific and Technical Development of Zhan Tianyou from Ministry of Railways of China. Professor Yang enjoys the special subsidy from the State Council. Thomas T.Y. Wong is Professor and Chairman of Electrical and Computer Engineering at the Illinois Institute of Technology, where he is the founding director of the Microwave Laboratory. He received the B.Sc. degree from the University of Hong Kong in 1975 and the M.S. and Ph.D. degrees from Northwestern University in 1978 and 1980 respectively, all degrees being in electrical engineering. From 1975 to 1976, he was a Product Engineer at Motorola Semiconductor (Hong Kong) Sector. He pursued graduate research at Northwestern University, where he participated in the development of microwave equipment for material property measurement covering the frequency range of 1 MHz to 60 GHz. He made measurements on the conductivity properties of solid electrolytes and developed a theoretical model for charge transport from which a scaling relation for identifying jump diffusion process was obtained. He joined the Illinois Institute of Technology in 1981 as an Assistant Professor. In this role, he introduced courses on microwave theory, electron devices,

quantum electronics, and electronic materials, while initiating research on transient phenomena and wave propagation effects in high-speed semiconductor devices and integrated circuits. Out of this early effort, he developed the numerical Bromwich integration to enable the early-time response of devices and electromagnetic scatterers to be calculated to any specified precision, and established 150 nm as the upper bound for the width of the gate periphery of a GaAs field-effect transistor for negligible pulse dispersion. In the ensuing years, he established the Microwave Laboratory, which supported research efforts on nonlinear device measurements, broadband millimeter-wave communication systems, semi-open structures for material property measurements, and dielectric resonator applications. He collaborated with national laboratories in research on particle acceleration and laser measurements. He published the first book on the subject of distributed amplification (Fundamentals of Distributed Amplification, Artech 1993) and it remains until today the only book on this subject since the concept was put forth over 50 years ago. He is the originator of several patents on microwave electronics and wireless communication system design. He was the Graduate Program Director of the ECE Department of IIT from 1987-1995, and in the 1998 academic year, he was the Chair of the University Faculty Council. He served on the organizing committee of several international conferences and is a frequent reviewer for

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several engineering journals and technical book publishers.

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