

---

**ELECTROMAGNETIC WAVES**  
**PIERM 93**

---

**Progress**

**In**

**Electromagnetics**

**Research M**

© 2020 EMW Publishing. All rights reserved.

No part of this publication may be reproduced. Request for permission should be addressed to the Publisher.

All inquiries regarding copyrighted material from this publication, manuscript submission instructions, and subscription orders and price information should be directed to: EMW Publishing, P. O. Box 425517, Kendall Square, Cambridge, Massachusetts 02142, USA.

---

**ELECTROMAGNETIC WAVES**  
**PIERM 93**

---

**Progress**  
**In**  
**Electromagnetics**  
**Research M**

Chief Editors: Weng Cho Chew and Sailing He

EMW Publishing  
Cambridge, Massachusetts, USA



## CONTENTS

<b>A Polarization Reconfigurable Cylindrical Dielectric Resonator Antenna</b> Lei Zhong .....	1
<b>Design of a Dual-Band Antenna System for LTE-M and LTE-MIMO by Exploiting the Characteristic Mode Theory</b> Kadidiatou Diallo, Aliou Diallo, Ibra Dioum, Samuel Ouya, and Jean M. Ribero .....	11
<b>Low Sidelobe Cosecant-Squared Pattern Synthesis for Large Planar Array Using Genetic Algorithm</b> Tarek Sallam and Ahmed M. Attiya .....	23
<b>Maxwell's Derivation of the Lorentz Force from Faraday's Law</b> Arthur D. Yaghjian .....	35
<b>Miniature Circularly Polarized Antenna for UHF RFID Handheld Reader: Design and Experiments</b> Le-Huy Trinh, Khai-Thong Lu, Manh-Thao Nguyen, Nguyen-Vu Truong, and Fabien Ferrero ...	43
<b>A Penta Band Notched Elliptical Planar Monopole Antenna for UWB Applications</b> Devireddy Sreenivasa Rao and Immadi Govardhani .....	53
<b>Bi-Anisotropic Particles and Chiral Inclusions for Highly-Efficient Electromagnetic Energy Harvesting</b> Hemn Younesiraad and Mohammad Bemani .....	67
<b>Design and Analysis of Compact Periodic Slot Multiband Antenna with Defected Ground Structure for Wireless Applications</b> Bondili S. Hari Prasad and Mokkapat V. S. Prasad .....	77
<b>Yagi-Uda Combined Radiating Structures of Centimeter and Millimeter Wave Band</b> Sergey L. Berdnik, Victor A. Katrich, Mikhail V. Nesterenko, Yuriy M. Penkin and Oleksandr M. Dumin .....	89
<b>Design of a Beam Switchtable Superdirective Dipole for IoT Gateway</b> Sana Souai, Aliou Diallo, Jean Marc Ribero, and Taouifik Aguilu .....	99
<b>Perturbative Approach for Fast and Accurate Evaluation of Quasi Axially-Symmetric Cavity Resonance Frequency in Drift Tube Linacs</b> Giorgio S. Mauro, Santi C. Pavone, Giuseppe Torrisi, Antonio Palmieri, Luigi Celona Santo Gammino and Gino Sorbello .....	109
<b>The Upper Bound of the Speed of Propagation of Waves along a Transmission Line</b> Vernon Cooray, Gerald Cooray, Farhad Rachidi, and Marcos Rubinstein .....	119
<b>Fast Direction-Finding Algorithm by Partial Spatial Smoothing in Sparse MIMO Radar</b> Sheng Liu, Feng Qin, Jing Zhao, Weizhi Xiong, and Ziqing Yuan .....	127

**Contribution to the Experimental Characterization of the Electromagnetic Properties of HTS**

Yazid Statra, Hocine Menana, and Bruno Douine ..... 137

**A New Speed Multiplier Coaxial Magnetic Gear**Mohd Firdaus Mohd Ab Halim, Erwan Sulaiman, Raja Nor Firdaus Kashfi Raja Othman  
and Azhan Ab. Rahman ..... 145**Design and Analysis of a Microstrip Planar UWB Bandpass Filter with Triple Notch Bands for WiMAX, WLAN, and X-Band Satellite Communication Systems**

Abdul Basit, Muhammad I. Khattak, and Mu'ath Al-Hasan ..... 155

**Design of a Directional Antenna Based on a Resonance Based Reflector and Its Applications on Bio-Electromagnetics**

Xiao-Feng Li, Yan-Ru Hua, Bao-Jian Wen, Lin Peng, and Xing Jiang ..... 165

**GPR Data Regression and Clustering by the Fuzzy Support Vector Machine and Regression**

Shahram Hosseinzadeh and Mehdi Shaghghi ..... 175

**Study of Frequency Characteristics for Three-Coil Wireless Power Transfer System with Different Positions**

Xueyi Zhang, Yang Yuan, and Zhongqi Li ..... 185

**Research on Active Disturbance Rejection Control of Hybrid Excitation Magnetic Suspension Switched Reluctance Motor Considering Noise**

Yonghong Huang, Libin Yan, Fan Yang, and Wenjun Zeng ..... 197