Progress
In
Electromagnetics
Research Letters
Progress
In
Electromagnetics
Research Letters

Chief Editors: Weng Cho Chew and Sailing He

EMW Publishing
Cambridge, Massachusetts, USA
## CONTENTS

**Reflection and Transmission of an Electromagnetic Wave due to Fractal Slab Sandwiched between Ordinary Material**  
Safiullah Khan, Muhammad J. Mughal, and Qaisar A. Naqvi .......................... 1

**Mutual Coupling Calibration for L-Shaped Microstrip Antenna Array with Accurate 2-D Direction of Arrival Estimation**  
Jianhui Bao, Qiulin Huang, Xinhua Wang, Peng Liu, and Xiaowei Shi ....................... 9

**An Improved TEM Antenna Designing Used in Electromagnetic Pulse Directed Radiation**  
Hang Li and Shoulin Yin ................................................................. 17

**The Eikonal Equation for Metamaterials Optics from a Moving Boundary Variational Principle**  
Consuelo Bellver-Cembreros and Marcelo Rodríguez-Danta .............................. 23

**ACS Feed Compact Multiband Antenna for Personal Wireless Communication Applications**  
Avinash Tambe, Rekha Labade, Shankar B. Deosarkar, and Rahul Parbat ............... 31

**Circular Polarized Transparent Antenna for 5.8 GHz WLAN Applications**  
Wizatul I. Wahid, Muhammad R. Kamarudin, Mohsen Khalily, and Thomas Peter ........ 39

**A Circularly Polarized Antenna Array with a Convenient Bandwidth/Size Ratio Based on Non-I dentical Disc Elements**  
Stefano Maddio .................................................. 47

**Compact Microstrip Narrow Bandpass Filter with Good Selectivity and Wide Stopband Rejection for Ku-Band Applications**  
Haibo Jiang, Yujie Wang, and Lin Wang ................................................... 55

**Switchable Square Loop Frequency Selective Surface**  
Suhair M. Mahmood and Tayeb A. Denidni .................................................... 61

**A Novel Method from Bandpass to Dual-Band for Microwave Filter and Diplexer Design**  
Feng Qiu, Zhenghua Tang, Jianquan Huang, Dajun Lei, and Ming Yao ................... 65

**Numerical Dispersion Analysis for the 3-D High-Order WLP-FDTD Method**  
Wei-Jun Chen, Jun Quan, and Shi-Yu Long ................................................. 73

**A Novel Reconfigurable Spiral-Shaped Monopole Antenna for Biomedical Applications**  
Maryam Salim and Ali Pourziad .......................................................... 79

**Compact Stable Frequency Selective Surface Using Novel Y-Type Element**  
Rui Wu, Hou Zhang, Zi-Mu Yang, Tao Zhong, and Yongfan Lin ......................... 85
A Broadband Dual-Polarized Omnidirectional MIMO Antenna for 4G LTE Applications
Yiqiang Yu, Hongmei Zhang, and Zhizhang Chen ......................................................... 91

A Novel Compact Differential Microstrip Antenna
Shi-Jun Wang, Lin Li, and Min Fang ................................................................. 97

Localized Pseudo-Skeleton Approximation Method for Electromagnetic Analysis on Electrically Large Objects
Yong Zhang and Hai Lin ................................................................................. 103

Analysis of RWPT Relays for Intermediate-Range Simultaneous Wireless Information and Power Transfer System
Keke Ding, Ying Yu, and Hong Lin ................................................................. 111

Compact Four-Element Antenna Array Design for BeiDou Navigation Satellite System Applications
Jianxing Li, Hongyu Shi, Jianying Guo, and Anxue Zhang ................................. 117

Waveguide Integrated High-Gain Amplifier Module for Millimeter-Wave Applications
Young Chul Lee ....................................................................................... 125

Shape Feature Analysis of Concealed Objects with Passive Millimeter Wave Imaging
Seokwon Yeom, Dong-Su Lee, and Jung-Young Son ................................. 131