

# IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION

A PUBLICATION OF THE IEEE ANTENNAS AND PROPAGATION SOCIETY



AUGUST 2016

VOLUME 64

NUMBER 8

IETPAK

(ISSN 0018-926X)

---

Editorial ..... *K. W. Leung* 3279

---

## REGULAR PAPERS

### *Antennas*

- On-Chip Antenna Integration for Millimeter-Wave Single-Chip FMCW Radar, Providing High Efficiency and Isolation ..... *B. B. Adela, P. van Zeijl, U. Johannsen, and B. Smolders* 3281
- Compact Planar Ultrawideband Antennas With Continuously Tunable, Independent Band-Notched Filters ..... *M.-C. Tang, H. Wang, T. Deng, and R. W. Ziolkowski* 3292
- Analysis and Optimization of Terahertz Bolometer Antennas ..... *O. Markish and Y. Leviatan* 3302
- Gain-Enhanced Patch Antennas With Loading of Shorting Pins ..... *X. Zhang and L. Zhu* 3310
- Bandwidth and Directivity Enhancement of Loop Antenna by Nonperiodic Distribution of Mu-Negative Metamaterial Unit Cells ..... *S. Ahdi Rezaeieh, M. A. Antoniadou, and A. M. Abbosh* 3319
- A Dual-Polarized Leaky Lens Antenna for Wideband Focal Plane Arrays ..... *O. Yurduseven, N. Lombart Juan, and A. Neto* 3330
- Magnetolectric Dipole Antennas With Dual Open-Ended Slot Excitation ..... *H. W. Lai, K. K. So, H. Wong, C. H. Chan, and K. M. Luk* 3338
- New Subwavelength Profile Monopole-Type Antenna ..... *T. Yuan, A. Díaz-Rubio, and H. H. Ouslimani* 3347
- Experimentally Validated, Planar, Wideband, Electrically Small, Monopole Antennas Based on Capacitively Loaded Loop Resonators ..... *M.-C. Tang, Y. Chen, and R. W. Ziolkowski* 3353
- Sidelobe Reduction of  $TM_{12}$  Mode of Circular Patch via Nonresonant Narrow Slot ..... *P. Juyal and L. Shafai* 3361
- Fully Planar Amphibious Antenna Using Dual-Operational Mode Synthesized Transmission Lines ..... *H.-H. Chen, H. N. Chu, and T.-G. Ma* 3370

### *Arrays and Periodic Structures*

- Design of a Dual-Polarized Stacked Patch Antenna for Wide-Angle Scanning Reflectarrays ..... *T. Chaloun, V. Ziegler, and W. Menzel* 3380
- Polarized Beams Using Scalar Metasurfaces ..... *M. Casaletti, M. Śmierzchalski, M. Ettorre, R. Sauleau, and N. Capet* 3391
- Design of Wideband Bandstop Frequency-Selective Structures Using Stacked Parallel Strip Line Arrays ..... *A. Al-Sheikh and Z. Shen* 3401

---

(Contents Continued on Page 3277)

---

Full-Space Electronic Beam-Steering Transmitarray With Integrated Leaky-Wave Feed .....	<i>J. G. Nicholls and S. V. Hum</i>	3410
Dual-Band Base Station Array Using Filtering Antenna Elements for Mutual Coupling Suppression .....	<i>Y. Zhang, X. Y. Zhang, L.-H. Ye, and Y.-M. Pan</i>	3423
The Active Element Patterns of a Finite Array-Space and Leaky Wave Perspective .....	<i>A. K. Bhattacharyya</i>	3431
<i>Electromagnetics</i>		
Nonlinear Multiconductor Transmission Line Analysis of Broadband Switching Metamaterials .....	<i>S. M. Rudolph and W. S. Wall</i>	3441
Fast and Accurate Antenna Pattern Evaluation From Near-Field Data Acquired via Planar Spiral Scanning .....	<i>F. D'Agostino, F. Ferrara, C. Gennarelli, R. Guerriero, S. McBride, and M. Migliozi</i>	3450
Boundary Effects on the Determination of Electromagnetic Properties of Bianisotropic Metamaterials From Scattering Parameters .....	<i>U. C. Hasar, J. J. Barroso, M. Bute, A. Muratoglu, and M. Ertugrul</i>	3459
<i>Numerical Techniques</i>		
Current-Based Volume Integral Equation Formulation for Bianisotropic Materials .....	<i>P. Ylä-Oijala, J. Markkanen, and S. Järvenpää</i>	3470
A New Formulation for the Radiation Operator: Application to the Fast Computation of the Singular Value Decomposition .....	<i>G. Bellizzi</i>	3478
A Hybrid FEM/MoM Method for 3-D Electromagnetic Scattering in Layered Medium .....	<i>Y. Ren, Q. H. Liu, and Y. P. Chen</i>	3487
Stochastic Reduced-Order Electromagnetic Macromodels in FDTD .....	<i>A. Zadehgo</i>	3496
A New Hybrid Implicit-Explicit FDTD Method for Local Subgridding in Multiscale 2-D TE Scattering Problems .....	<i>A. Van Londersele, D. De Zutter, and D. Vande Ginste</i>	3509
Nonconformal FETI-DP Domain Decomposition Methods for FE-BI-MLFMA .....	<i>H.-W. Gao, M.-L. Yang, and X.-Q. Sheng</i>	3521
Fractional-Calculus-Based FDTD Algorithm for Ultrawideband Electromagnetic Characterization of Arbitrary Dispersive Dielectric Materials .....	<i>D. Caratelli, L. Mescia, P. Bia, and O. V. Stukach</i>	3533
Compressive Sensing for Monostatic Scattering From 3-D NURBS Geometries .....	<i>S.-R. Chai and L.-X. Guo</i>	3545
<i>Wave Propagation and Scattering</i>		
Simultaneous Microwave Imaging and Parameter Estimation Using Modified Level-Set Method .....	<i>M. R. Eskandari, M. Dehmollaian, and R. Saifan</i>	3554
Diffraction by an Impedance Strip at Almost Grazing Incidence .....	<i>I. V. Andronov and V. E. Petrov</i>	3565
Global Scattering Center Extraction for Radar Targets Using a Modified RANSAC Method .....	<i>J. Hu, W. Wang, Q. Zhai, J. Ou, R. Zhan, and J. Zhang</i>	3573
In-Situ ISAR Imaging of Wind Turbines .....	<i>C. J. Li, S.-T. Yang, and H. Ling</i>	3587
<i>Wireless</i>		
The $\alpha$ - $\eta$ - $\kappa$ - $\mu$ Fading Model .....	<i>M. D. Yacoub</i>	3597
A Spatially Aware Channel Model for Body-to-Body Communications .....	<i>F. Mani and R. D'Errico</i>	3611
Primary Contour Prediction Based on Detailed Topographic Data and Its Impact on TV White Space Availability .....	<i>G. P. Villardi, H. Harada, F. Kojima, and H. Yano</i>	3619
<hr/>		
COMMUNICATIONS		
Huygens Excitation in Debye Media in the FDTD Method .....	<i>B. Abdulkareem, J.-P. Bérenger, F. Costen, R. Himeno, and H. Yokota</i>	3632
Frequency Dispersion Compensation Through Variable Window Utilization in Time-Reversal Techniques for Electromagnetic Waves .....	<i>A. M. Abduljabbar, M. E. Yavuz, F. Costen, R. Himeno, and H. Yokota</i>	3636
Dual-Band Circularly Polarized Split Ring Resonators Loaded Square Slot Antenna .....	<i>K. Kandasamy, B. Majumder, J. Mukherjee, and K. P. Ray</i>	3640
A Compact Filtering Dielectric Resonator Antenna With Wide Bandwidth and High Gain .....	<i>P. F. Hu, Y. M. Pan, X. Y. Zhang, and S. Y. Zheng</i>	3645
A Differential-Fed UWB Antenna Element With Unidirectional Radiation .....	<i>M. Li and K.-M. Luk</i>	3651

---

---

Scanning Characteristics of Metamirror Antennae With Subwavelength Focal Distance .....	<i>S. N. Tsvetkova, V. S. Asadchy, and S. A. Tretyakov</i>	3656
Scattering of Evanescent Plane Waves by a Black Wedge at the Interface Between Isorefractive Media .....	<i>H. D. Basdemir</i>	3661
Polarization-Insensitive Single- and Broadband Switchable Absorber/Reflector and Its Realization Using a Novel Biasing Technique .....	<i>S. Ghosh and K. V. Srivastava</i>	3665
On the Treatment of Arbitrary Boundary Conditions Using a Fast Direct $\mathcal{H}$ -Matrix Solver in MoM .....	<i>A. Vogt, T. Reuschel, H.-D. Brüns, S. Le Borne, and C. Schuster</i>	3670
Multifunctional Microstrip Array Combining a Linear Polarizer and Focusing Metasurface .....	<i>H.-X. Xu, S. Tang, G.-M. Wang, T. Cai, W. Huang, Q. He, S. Sun, and L. Zhou</i>	3676
Gain Enhancement of Planar Antenna Enabled by Array of Split-Ring Resonators .....	<i>A. Dadgarpour, A. A. Kishk, and T. A. Denidni</i>	3682
Efficient 2-D Finite-Element Solution of Vector Wave Equation in a Class of Curved Polygons .....	<i>E. Khodapanah</i>	3687
Substrate-Integrated Two-Port Dual-Frequency Antenna .....	<i>Y.-X. Sun and K. W. Leung</i>	3692
Improvement of the Scanning Performance of the Extended Hemispherical Integrated Lens Antenna Using a Double Lens Focusing System .....	<i>N. T. Nguyen, A. V. Boriskin, L. Le Coq, and R. Sauleau</i>	3698
Synthesis of Scan- and Frequency-Invariant Low-Sidelobe Tapers for Planar Array Antennas ....	<i>W. P. M. N. Keizer</i>	3703
Small-Size LTE/WWAN Two-Strip Monopole Exciter Antenna Integration With Metal Covers .....	<i>S.-C. Chen and Y.-C. Tsou</i>	3707
Broadband Reflectarray Antenna on a Periodically Perforated Substrate .....	<i>M. Rafaei-Booket, Z. Atlasbaf, and M. Shahabadi</i>	3711
Effective Magnetic-Loop Array Antennas With Enhanced Bandwidth .....	<i>Q. Hou, C. Li, G. Sun, and X. Zhao</i>	3717
Compact Planar Loop-Dipole Composite Antenna With Director for Bandwidth Enhancement and Back Radiation Suppression .....	<i>S. Ahdi Rezaeieh and A. M. Abbosh</i>	3723
A Dual-Band, Inductively Coupled Miniaturized-Element Frequency Selective Surface With Higher Order Bandpass Response .....	<i>M. Gao, S. M. A. Momeni Hasan Abadi, and N. Behdad</i>	3729

---

CORRECTIONS

Correction to “Channel Model for the Surface Ducts: Large-Scale Path-Loss, Delay Spread, and AOA” .....	<i>E. Dinc and O. B. Akan</i>	3735
---	-------------------------------	------

---

CALL FOR PAPERS

Special Issue on “Antennas and Propagation Aspects of 5G Communications” .....		3737
--	--	------

---