

IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION

A PUBLICATION OF THE IEEE ANTENNAS AND PROPAGATION SOCIETY



JUNE 2025

VOLUME 73

NUMBER 6

IETPAK

(ISSN 0018-926X)

PAPERS

Antennas

- [Broadband H-Plane Horn Antenna Design Based on Ridge Gap Waveguide](#)
..... M. Khalily, A. Mallahzadeh, S. Danesh, E. Rajo-Iglesias, R. Tafazolli, and A. A. Kishk
- [Maximizing Independent Channels and Efficiency in BTS Array Antennas via EM Degrees of Freedom](#)
..... F. Puggelli, B. Biscontin, E. Martini, and S. Maci
- [A Single-Layer Wideband Composite Metasurface Consists of Ka-Band Reflectarray and Wide-Angle Scanning X-Band Phased Array](#)
..... Y. Su, M. Li, Y. Yang, W. Zhang, H. Xie, Y. Fan, and X. Lin
- [A Compact Planar Multisector Rectenna Array With Full-Wave Rectification for 3-D Uniform Wireless Powering of IoT nodes](#)
..... M. Kumar and A. Sharma
- [A Constrained Lens Antenna Generating One Thousand Dual-Polarized Beams for High-Throughput Satellite Systems](#)
..... G. Ruggerini, L. Russo, J. Galdeano, P. Angeletti, and G. Toso
- [A New Buffering Scheme for Shared-Aperture Dual-Band Base Station Antenna Array Utilizing Tight-Coupling Concept](#)
..... Y. He, S. Wang, G. Wei, C. Ding, and Y. J. Guo
- [FSIW Cavity-Based Self-Packaging Filtering Slot Antennas With Wide-Stopband and High-Frequency Selectivity](#)
..... X. Zhou, G. Zhang, K.-W. Tam, Z. Pang, Z. Zhang, H. Lin, and J. Hong
- [A Directional Pattern Reconfigurable Low-Frequency Antenna Based on Permanent Magnet Array](#)
..... Y. Cui, Z. Yuan, Z. Cui, Y. Zhang, C. Wang, Y. Pei, Y. Li, and X. Song
- [Fast Surface Error Diagnosis for Radiotelescopes Using Linearized Microwave Holography](#)
..... C. Fontá Romero, F. Rodríguez Varela, B. Galocha Iragüen, and J.-A. López-Pérez
- [A Wideband Dual-Circularly Polarized Transmitarray Antenna Based on Magnetolectric Dipole Elements and Source](#)
..... S. Gao and H. Wong
- [A Deep-Learning-Based Modeling Method for Phase-Free Near-Field Scanning Measurements](#)
..... S.-L. Zhao, J.-F. Wu, Y. Song, L.-D. Chen, and Z.-T. Xiao
- [A Highly Integrated Vehicle's Headlight With a Dielectric Resonant Antenna and a 3-D Printed Beam-Scanning Lens in the Adaptive Front-Lighting System for C-V2X Applications](#)
..... X. Zhu and B. Zhang
- [A Broadband and Stable-Gain Substrate-Integrated Cavity Antenna Using Two-Level High-Order Modes](#)
..... X. Jiang, X. Li, Z. Qi, W. Zhao, Y. Xie, and X. Liu
- [A Real-Time Approach for Multiphysics Field Reconstruction of Active Phased Array Antenna](#)
..... S. Feng, Q. Chen, Z. Li, and M. A. Sotelo
- [A Fully Polarized 1-D Beam-Scanning Phased Array Based on Active Integrated Linear Array](#)
..... L. Zhang, K. Wang, Y. Gan, and H. Meng
- [An Ultrawideband Quad-Mode SIW Cavity-Backed Slot Antenna for NextG Communication and Sensing Arrays](#)
..... A. V. Muppala and K. Sarabandi
- [3D-Printed All-Metal Modular Low-Profile Ultrawideband Tightly Coupled Dipole Arrays](#)
..... X. Wu, F. Yang, K. Chen, Y. Chen, J. Hu, and S. Yang
- [Analysis of High-Order Mutual Coupling Effect of Antenna Arrays Based on Infinitesimal Dipole Model](#)
..... S. Lou, S. Qian, S. Lian, W. Wang, H. Bao, and G. Leng
- [High-Gain, Low-Cost Polarization-Reconfigurable Antenna With Switchable Single and Dual Beams by Digital Phase-Coding Method](#)
..... M. Chen, S. Lei, J. Shu, K. Sun, B. Chen, and H. Hu
- [An Efficient Multibeamforming Method Based on 1-bit Phase Modulation for Time-Modulated Arrays](#)
..... Y. Man, P. Yang, L. Yin, H. Yang, Y. Zhao, Z. Wu, Y. Pu, Z. Wen, and Y. Luo
- [A Dual-Polarized Fixed-Frequency Beam-Scanning Leaky Wave Antenna for 5G Millimeter-Wave Applications](#)
..... B. Wei, Z. Li, Z. Xiong, Y. Zhao, M. Chen, and J. Wang
- [Element-Level Polarization-Switchable Beamforming Empowering Three-Stage Phased Array Antennas](#)
..... Y. Wang, Q. Xue, and Y. Wan

Arrays and Periodic Structures

- [All-Metallic-Metasurface-Based Wideband Dual Fabry–Perot Resonance Antenna Array With High Directivity and Polarization Purity](#) B. F. Gomes, A. U. Zaman, and J. R. Mejía-Salazar
- [A Dual-Polarized Wideband Phased Array With Enhanced Low-Scattering Characteristics Enabled by Unbalanced Coupling Structures](#) L. Xu, K. Chen, F. Yang, Z. Zhang, X. Wu, Y. Chen, and S. Yang
- [Proposal and Demonstration of a Frequency-Selective Surface With Nonreciprocity Depending on Direction and Frequency](#) K. Takahagi and A. Tennant
- [Efficient Array Pattern Synthesis via Principal Angle-Based Sparse Sampling \(PABSS\)](#) L. Chen and Y. Liu
- [An Irregular Optimizing Design of Connected Vivaldi Array for Wideband and Wide-Angle Scanning](#) Y. Zhang, P.-F. Gu, Z. He, H.-G. Bao, J. Xu, J.-X. Sun, Y.-J. Cheng, Z.-H. Fan, and D.-Z. Ding
- [Low-Profile and Wideband Paper-Based Honeycomb Microwave Absorber With Capacitive Loops](#) Y. Han, M. Liang, Q. Ji, Q. Li, and W. Che
- [Wideband Circularly Polarized Active Heatsink Antenna Array](#) B. Zhao, M. Tang, S. Lan, Q. Xu, Y.-P. Zhang, and J. Mao

Electromagnetics

- [Chu Circuit Models as Minimum Energy Representations of Wave Impedances](#) K. Schab and L. Jelinek
- [Pulsed Electromagnetic Field Interaction With a Transmission Line: An Analytical Traveling-Wave Approach Based on Reciprocity](#) M. Štumpf, G. Antonini, I. E. Lager, and J. Ekman
- [Differential Coaxial Coils for Frequency-Independent Deep Magnetic Focusing on Implantable Devices](#) S. A. A. Shah, Y. R. Kim, Y.-S. Kim, S. Y. Jeong, and C. T. Rim

Numerical Methods

- [Interpolatory Curl-Conforming Vector Bases for Pyramid Cells](#) R. D. Graglia, D. Franzò, and P. Petrini
- [Accelerated Boundary Integral Solution of 3-D Maxwell's Equations Using the Interpolated Factored Green Function Method](#) J. Paul and C. Sideris
- [An Accelerated Reduced-Order Characteristic Mode Analysis](#) H. Schreiber, P. Herwigk, and M. Leone
- [An Efficient and Versatile Conformal Aperture Inverse Design Framework Based on IDMBSA](#) C.-S. Chen, J.-C. Liang, J.-P. Liu, J. Shao, R. Wang, and B.-Z. Wang
- [Accurate Modeling of Time-Varying Lumped Elements in Space–Time Metasurfaces](#) L. Chen, J. W. You, X. W. Wu, Q. Xiao, Z. Gu, S. L. Qin, T. J. Peng, Q. Ma, Y. Q. Mao, J. N. Zhang, and T. J. Cui
- [Low-Dispersive FDFD Method for Large-Scale 3-D Scattering Problem](#) Z. Ma, B. Zou, and L. Zhang
- [Accelerated DGTD Method Employing Hybrid Time Integration Scheme of Runge–Kutta Time Stepping and Neural Network Prediction](#) P. Wen, W. Kong, N. Hu, and X. Wang

Wave Propagation and Scattering

- [Radiation Measurements of an Electrically Short Time-Varying Wideband VLF/LF Antenna](#) K. Whitmore, M. B. Cohen, P. Hansen, P. Singer, M. Julch, C. Lampley, K. E. Miller, and H. Yeager
- [Dual-Polarized MIMO UAV-to-Ground Tree Shadowed Channel: Capacity, Multiplexing, Stationarity, and Statistical Modeling Assessment](#) K. Psychogios, N. Moraitis, and A. D. Panagopoulos
- [The Antenna Pattern Reconstruction Based on Mid-Field Phaseless Measured Data Using a Simplified Extrapolation Technique](#) L. Yu, F. Zhang, Y. Zhang, X. Zhang, Z. Wang, Y. Jing, and W. Fan
- [Micro-Doppler-Coded Drone Identification via Resonant Tagging](#) D. Vouchuk, M. Khobzei, V. Tkach, O. Eliashiv, O. Tzidki, K. Grotov, A. Glam, and P. Ginzburg
- [Robust Iterative Permittivity Inversion With Projection-Based Reduced Order Models](#) T. Shao, Z. Jia, M. Li, S. Xu, and F. Yang
- [Characterization of Sub-THz Channel Sounding Systems in OTA Measurement Scenarios Using a Vector Network Analyzer](#) M. D. Al-Dabbagh, D. Ulm, T. Doeker, D. Dupleich, A. Ebert, R. S. Thomä, T. Kürner, D. A. Humphreys, and T. Kleine-Ostmann
- [Bounds on the Coupling Strengths of Communication Channels and Their Information Capacities](#) Z. Kuang, D. A. B. Miller, and O. D. Miller
- [A Generalizable Physics-Guided Convolutional Neural Network for Irregular Terrain Propagation](#) S. Huang, H. Qin, W. Hou, X. Zhang, and X. Zhang
- [TDOA Prior-Based Contrast Source Inversion for Microwave Ablation Zone Quantitative Imaging](#) H. Muramatsu and S. Kidera
- [Design of MIMO Planar Sparse Array and Improved Back-Projection Algorithm for High-Performance 3-D Microwave Imaging](#) Z. Dong, Y. He, K. Xu, S. Hu, Q. Lv, X. Qi, X. Ma, X. Li, C. Sun, J. Su, and W. Li

Other Topics

- [High-Precision Antenna Modeling Using Recurrent Neural Networks With Bidirectional LSTM Layers and Dimensionality Reduction](#) K. C. Sahu, S. Koziel, and A. Pietrenko-Dabrowska
- [Circular Statistics for Antenna Measurements](#) M. Verdaasdonk, A. B. Smolders, and A. C. F. Reniers
- [Polarization-Space Modulation With Reconfigurable Intelligent Surfaces, Robust Estimation, and Quaternion Neural Networks](#) A. M. Buwarp, L. Mili, K. V. Mishra, and A. I. Zaghloul
- [Physical Layer Secure Transmission for Multiuser Scenarios Using 4-D Antenna Arrays With Pseudorandom Time Modulation](#) K. Chen, X. Gong, F. Yang, Y. Chen, S.-W. Qu, and S. Yang
- [Radar Target HRRP Imitation Based on Nonperiodic Time-Coding Digital Metasurface](#) J. Guo, D. Guan, Z. Liu, S. Yu, H. Xu, P. Hu, and P. You
- [Midrange Radiative Wireless Power Transfer Based on the Improved Half-Fisheye Lens](#) Y. Lou, Y. Xia, H. Zhou, S. Chen, and Q. Zhu

COMMUNICATIONS

- [Planar Surface-Wave Antenna for CubeSats With Directive Radiation Exactly at Endfire](#) K. M. Alrushud, V. G.-G. Buendía, and S. K. Podilchak

An Optically Transparent Near-Zero-Index Grating Metamaterial for Enhanced On-Glass Millimeter-Wave Radiation	Z. Zhou, Y. Zhang, Z. Kuang, Y. Li, and Z. D. Chen
A Method for Reducing High-Frequency Sidelobes of a Millimeter-Wave Double-Ridged Horn Antenna	B. S. Cross and D. S. Filipovic
A Metal Integrated Suspended Line Fed Bidirectional Radiation Slot Array for Millimeter-Wave Applications	R. Liu, K. Ma, Y. Wu, N. Yan, and Y. Wang
Modal Analysis of an Endfire Traveling Wave Antenna With High Gain and High Efficiency	Y. Pan and J. Liu
Characterizing Ultrawideband Scattering From Penetrable Objects Using a Stabilized and Well-Conditioned TDIE With Laguerre Polynomials	R. Bai, M.-D. Zhu, H. Zhang, Z. Du, Z. Chen, L. Huang, H. Xie, J. Leng, and W.-Y. Yin
On the Convergence of Finite Element Domain Decomposition Methods for Discontinuous Subdomain Interfaces	X.-M. Xin, H.-W. Gao, S. Wang, Q. J. Lim, and Z. Peng
Mode Analysis of Dielectric Resonator Antenna Based on Multipole Moment Expansion Theory	J. Ren, W. Li, Y.-T. Liu, and Y. Yin
Isoflux, Flat-Top, and Pencil-Beam Pattern Reconfigurable Circularly Polarized Antenna Using Liquid Dielectric	X. Ren, Z. Lin, Z. Chen, and H. Wong
The Inverse Scattering of Second-Order Nonlinear Media Based on Distorted Born Iterative Method	S. Q. Wu and B. O. Zhu
A Compact Frog-Shaped Self-Diplexed MIMO Antenna With SD-HMSIW Technique for WLAN Applications	A. K. Pandey, R. K. Gangwar, and R. K. Chaudhary
Broadband Dual-Polarized High-Selectivity Angular Selective Surfaces Using Polarization-Decoupling Method	X. Xiu, S. Li, M. Xu, J. Liu, M. Yan, W. Feng, W. Che, and Q. Xue
Wideband RCS Reduction of Dual-Band Fabry–Perot Cavity Antenna Using Pancharatnam–Berry Phase Coding Metasurface and AMC Surface ...	L. Xu, Y. Liu, and W. Zhang
Reconfigurable Dual-Functional Reflective Polarization Converter Based on Liquid Crystal Terahertz Metasurfaces	G. Deng, Y. Zhu, Q. Zhang, J. Yang, Y. Li, and Z. Yin
Stable and Continuous Dual-Band Leaky Wave Radiation Based on the SSPPs and Periodic Mode-Modulation Method	M. Wang, Q. Yao, J. R. Chen, Z. W. Cheng, T. J. Cui, and H. F. Ma
An Efficient Method to Compute Fock Integrals for High-Frequency Electromagnetic Scattering From Coated Convex Surfaces by Numerical Contour Deformation	Y. Y. Dou and Y. M. Wu
Quasi-Full-Metal mmW Circularly Polarized Endfire Antenna With Small Cross Section Based on SSPP	D. Liu, L. Chang, A. Zhang, Y. Li, and B. Wu

ANNOUNCEMENTS

[Call for Papers: Issue Microwave, mm and THz Imaging and Sensing Systems and Technologies for Medical Applications](#)

[Call for Papers: Numerical and Analytical Methods for Complex Electromagnetic Media](#)
