IEEE TRANSACTIONS ON

ANTENNAS AND PROPAGATION

A PUBLICATION OF THE IEEE ANTENNAS AND PROPAGATION SOCIETY

MAY 2024 VOLUME 72 NUMBER 5 IETPAK (ISSN 0018-926X)

PAPERS

Antennas

A Novel Low-Cost H-Plane Decoupling Technique for Two Closely Placed Patch Antennas Using Electric and Magnetic Coupling Cancellation . . . . . *J. Qian, B. S. Izquierdo, S. Gao, H. Wang, H. Zhou, and H. Xu*

Design of MIMO Antennas With DRAs and a Dual-Function Decoupling/Radiating Monopole Antenna . . . . . *C. Tong, N. Yang, K. W. Leung, and G. Liu*

Millimeter-Wave Endfire Magnetoelectric Dipole Antenna and Array With Horizontal Polarization and Wide Bandwidth . . . . . *J. Wang, F. Wu, Z. H. Jiang, and K.-M. Luk*

An Optimized Multiband Antenna for UWB Ad Hoc Networks Based on Topology Optimization Theory . . . . . *Y. Wu, F. Shen, T. Wan, Y. Liang, Y. Lu, X. Xu, D. Xu, and B. Lu*

Broadband Dual-Polarized Filtering Metasurface-Based Antennas Using Characteristic Mode Analysis for 5G Millimeter-Wave Applications . . . . . *W. Yang, J. Huang, D. Chen, K.-L. Yu, Q. Xue, and W. Che*

Collimating Truncated Virtual Image Lens . . . . . *O. Zetterstrom, N. J. G. Fonseca, and O. Quevedo-Teruel*

Shared-Aperture Design of the Cellular Antenna and Satellite Communication Antenna With Circular Polarization in S-Band for Metal-Bezel Smartphones . . . . . *S. Rao and Y. Wang*

Frequency-Diverse Bunching Metasurface Antenna for Microwave Computational Imaging . . . . . *M. Zhao, S. Zhu, D. Li, T. Fromenteze, M. Khalily, X. Chen, V. Fusco, and O. Yurduseven*

High-Efficiency Class-E Seamlessly Integrated Active-Integrated Antennas of Far-Field SWIPT Base Stations for Batteryless IoT Applications . . . . . *J. V. de Almeida, X. Gu, and K. Wu*

Shape Optimization Design Method of High-Performance Multibeam Antenna for Mixed-Payload Communication Satellite . . . . . *X. Tao, P.-F. Gu, Z. He, X.-G. Zhang, X.-M. Mei, W. Ding, and D.-Z. Ding*

An Efficient Optimization Method for HCC Antennas Using Quantum Genes Based on Sparse Artificial Neural Networks . . . . . *F. Peng and X. Chen*

A Reverberation Chamber for Antenna Measurements up to 140 GHz . . . . . *A. Hubrechsen, L. A. Bronckers, S. J. Verwer, A. C. F. Reniers, and A. B. Smolders*

3-D-Corrugated Ground Structure: A Microstrip Antenna Miniaturization Technique . . . . . *P. B. Samal, S. J. Chen, and C. Fumeaux*

Design of On-Body Epidermal Antenna on AMC Substrate for UHF RFID in Healthcare . . . . . *G. A. Casula, F. Lestini, F. P. Chietera, G. Muntoni, C. Occhiuzzi, L. Catarinucci, R. Colella, G. Montisci, and G. Marrocco*

A Fixed-Beam Leaky Wave Antenna With Coupling Elements of Multiresonance . . . . . *H. Tian and J. Liu*

Tolerance Analysis of Near-Field Focused Arrays to Safe-for-Humans Microwave and RF Applications . . . . . *G. Buonanno and S. Costanzo*

Increasing the Bandwidth of Antennas Based on the Frequency Pulling Technique: Theoretical Limitations and Practical Considerations . . . . . *A. G. Koutinos, C. L. Zekios, S. V. Georgakopoulos, and G. A. Kyriacou*

High-Gain Circularly Polarized 500–750 GHz Lens Antenna Enabled by Silicon Micromachining . . . . . *A. Madannejad, M. M. Gohari, U. Shah, and J. Oberhammer*

Heterogeneous Metasurface Empowering Proximate High-Permittivity Ceramic Cover for a 5G Dual-Band Millimeter-Wave Smartphone . . . . . *B. Kim, J. Jung, S. Yun, H. Kim, and J. Oh*

Full-Metal Omnidirectional Filtenna Array Using 3-D Metal Printing Technology . . . . . *S.-Q. Zhang, S.-W. Wong, Z. Zhang, and Y. He*

High-Gain and High-Efficiency Sub-Terahertz Antenna-on-Chip With Microbumps for Highly-Integrated Systems . . . . . *T. Deng, Y. Zhang, Z. Zheng, Q. Yan, and J.-F. Mao*

Arrays and Periodic Structures

A Hierarchical Impedance Matching Approach for Ultrawideband Absorbers With Wide Angular Stability . . . . . *J. Qin, M. Sun, M. Wang, M. Guan, and A. Chen*

Wide-Angle Scanning Design of Irregular Arrays Based on Unequal Phase Feeding . . . . . *Y. Ma, Q. Feng, Q. Jin, and Q. Xiang*

Wideband Reconfigurable Metasurface for Multiangle Linear Polarization Rotation . . . . . *X. Yu, H. Zhou, P. Wang, H. Yang, Y. Wang, and Z. Yan*

Design of Linear and Planar Arrays With Low Sidelobe Levels and High Directivity Using Two-Way Array Factor . . . . . *R. Rajender, S. Choudhury, K. R. Subhashini, G. Ciarpi, S. Genovesi, and D. Rossi*

Ultra-Wideband Vertically Polarized Long-Slot Circular Phased Array . . . . . *G. Wei, Y. Wang, Y. He, R. W. Ziolkowski, and Y. J. Guo*

Planar Polarization Rotation Pattern Manipulation Surfaces With Enhanced Incident Angle Range and Beam-Steering Ability . . . . . *D. Yin, L. Zhu, B. Li, and B. Xue*

Design of Clustered Phased Arrays by Means of an Innovative Power Pattern Matching-Driven Method—The Linear Array Case . . . . . *A. Benoni, L. Poli, P. Rocca, and A. Massa*

Engineering of Intelligent Reflecting Surfaces: Reflection Locality and Angular Stability . . . . . *J. Shabanpour, V. Lenets, G. Lerosey, S. Tretyakov, and C. Simovski*

Single-Layer, All-Metallic Metasurface Filter With Nearly 90° Angularly Stable Resonance . . . . . *N. Goshen and Y. Mazor*

An Active Multifunctional Metamaterial With Four Operating Modes . . . . . *B. Jiang, H. Hu, J. Tian, S. Lei, Y. Wu, and B. Chen*

Synthesis of Large-Scale Planar Isophoric Sparse Arrays Using Iterative Least Squares With Nonredundant Constraints (ILS-NRC) . . . . . *L. Chen, Y. Liu, Y.-L. Ban, S. Yang, and Y. J. Guo*

Convex Optimization of Wideband Monopulse Arrays . . . . . *H. Frid, H. Hultin, and B. L. G. Jonsson*

Wide-Angle Impedance Matching of a Patch Antenna Phased Array Using Artificial Dielectric Sheets . . . . . *M. Soltani and G. V. Eleftheriades*

ANN-Assisted Quasi-Time-Invariant Beamforming for Retrodirective Frequency Diverse Array . . . . . *Y. Q. Hei, X. Y. Ju, L. Y. Ma, W. T. Li, and X. W. Shi*

Laminated Miniaturized Low-Frequency Metamaterial Block for Near-FieldWireless Power Transmission Applications . . . . . *H. Ma, R. Liu, J. Zhang, J. Pang, and Q. Tan*

Preprocessing-Based Fast Design of Multiple EM Structures With One Deep Neural Network . . . . . *P. Wang, Z. Li, C. Luo, Z. Wei, T. Wu, W. Jiang, T. Hong, N. O. Parchin, G. F. Pedersen, and M. Shen*

Smart Electromagnetic Skin to Enhance Near-Field Coverage in mm-Wave 5G Indoor Scenarios . . . . . *Á. F. Vaquero, E. Martinez-de-Rioja, M. Arrebola, J. A. Encinar, and M. Achour*

A Technique for In Situ Calibration of an Antenna Array Using Spherical Mode Expansions . . . . . *J. D. Kuric and I. J. Gupta*

Compact Dual-Circularly Polarized Reflectarray Antenna Using Semicircle Strips Elements With Independent Focus and Beam Directions . . . . . *S. Gao, S. Li, H. Zhao, and X. Yin*

Simultaneous Inverse Design and Uncertainty Quantification for Frequency-Selective Rasorber With Tunable and Switchable Abilities by Bayesian Deep Learning . . . . . *E. Li, E. Zhu, T. Xiao, B. Wang, Z. Wei, Q. Wang, F. Qin, and W.-Y. Yin*

A 3-D Wideband and High-Selectivity Amplifying Frequency-Selective Surface Based on Slot Line and Microstrip Line . . . . . *Y. Zou, X. Kong, S. Zhou, L. Wang, Y. Zhao, and S. Gao*

Electromagnetics

Virtual Polarizer: Coherent Perfect Ultrawideband Polarization Control of Chiral Electromagnetic Waves . . . . . *Y.-R. Wu, R.-Y. Dong, and H.-F. Zhang*

Near-Field Computational Imaging With RIS Generated Virtual Masks . . . . . *Y. Jiang, F. Gao, Y. Liu, S. Jin, and T. Cui*

Signal Preemphasis Technique for 10–60 MHz High-Speed Implant Communication System With Bandwidth-Limited Small Antennas . . . . . *L. Liu, H. Takagi, K. Miyazaki, J. Shi, and J. Wang*

A Complete Nonuniform Asymptotic Expansion of the Dyadic Green's Function for Dielectric Half-Space . . . . . *I.-S. Koh*

Numerical Methods

NUFFT-Accelerated Spectral-Domain MoM With Asymmetric Rooftop Basis Functions for Multilayered Structures With Periodic Metallizations . . . . . *J. Córcoles, M. Camacho, and R. R. Boix*

FDTD Voxels-in-Cell Method With Debye Media . . . . . *K. Tekbaş, J.-P. Bérenger, L. M. Diaz Angulo, M. Ruiz-Cabello, and S. G. Garcia*

A High-Order Ultraweak Variational Formulation for Electromagnetic Waves Utilizing Curved Elements . . . . . *T. Lähivaara, W. F. Hall, M. Malinen, D. Ota, V. Shankar, and P. Monk*

Extended Higher-Order Array Decomposition Method for Fully Populated or Thinned Array Antennas and Scatterers With Connected Elements . . . . . *M. Brandt-Møller, M. Mattes, O. Breinbjerg, M. Zhou, and E. Jørgensen*

Improved Chebyshev Spectral Method Modeling for Vector Radiative Transfer in Atmospheric Propagation . . . . . *E. Tavanti, D. D. Caviglia, and A. Randazzo*

Wave Propagation and Scattering

Inverse Design of Multifunctional Frequency-Selective Surface Under Inhomogeneous Background . . . . . *E. Zhu, E. Li, T. Xiao, Z. Wei, Q. Wang, F. Qin, and W.-Y. Yin*

Mismatched Luneburg Lenses: Numerical Analysis and Design Rules . . . . . *V. Kaschten, D. Tihon, D. Lederer, and C. Craeye*

Virtual Experiments via LSM for Quantitative 2-D Inverse Scattering: Challenges and Opportunities . . . . . *M. T. Bevacqua and L. Di Donato*

Mode-Based Superdirective Optimization Strategy for Multilayered Dielectric Cylinders . . . . . *W. Chen, B. Lv, J. Fu, T. Jiang, and Y. Li*

Scattering of UAV Swarm via Artificial Plasma Cloud for Probable Over-the-Horizon Detection at VHF Band . . . . . *W. Tang, Z.-W. Xu, H.-S. Zhao, and K. Xue*

High-Efficiency Transmissive Tunable Metasurfaces for Binary Cascaded Diffractive Layers . . . . . *Y. Jia, H. Lu, Z. Fan, B. Wu, F. Qu, M.-J. Zhao, C. Qian, and H. Chen*

Other Topics

Fast Beam-Pointing Control Algorithms Based on Deep Learning Models for Moving Target in MWPT . . . . . *D. Xiao, L. Tian, L. Xu, H. Zhang, and X. Wang*

A Model of the Magneto-Inductive Link With Relays to Cross the Air–Water Interface . . . . . *A. Forget, P. Rangraz, and J.-F. Bousquet*

ISAR Imaging of Target Exhibiting Micro-Motion Components Based on Joint Constraints of Low Rank and Structured Sparsity . . . . . *Y. Mai, W. Jiang, S. Zhang, C. Zhang, Y. Liu, and X. Li*

COMMUNICATIONS

Mixed-Modes-Enabled Element-Level Beamforming Antenna With Enhanced Isolation for Phased Array Applications . . . . . *Y. Wang, Q. Xue, Z. Hu, and S. Liao*

Dual-CP Antenna With Wide-HPBW and Wide-ARBW Performance for Wide-Angle Scanning Phased Array . . . . . *L.-X. Xia, N.-W. Liu, L. Zhu, and G. Fu*

Multifunctional Metasurface: Simultaneous Beam Steering, Polarization Conversion, and Phase Offset . . . . . *X. Yang, E. Wen, D. Bharadia, and D. F. Sievenpiper*

Compact Dual-Band Shared-Aperture Omnidirectional Biconical Antenna for Microwave and Millimeter-Wave Applications . . . . . *K. Ye, Y. Lu, Q. You, K. Wang, J. Xu, and J. Huang*

Ultrathin Dual Polarization Huygens' Element With Broadband Electric and Magnetic Resonance Modes Degeneracy for Ka-Band Conformal Lens Antenna . . . . . *Z.-H. Fu, X.-S. Yang, L.-L. Wang, Z. N. Chen, and B.-Z. Wang*

A Wideband and High-Polarization-Purity Leaky Wave Antenna With Continuous Backward-to-Forward Scanning Based on Mode Modulation . . . . . *M. Wang, J. R. Chen, H. F. Ma, and T. J. Cui*

A Multipoint Feeding Stub-Loaded Dipole With 10 f_0 Out-of-Band Harmonic Suppression . . . . . *Y. Luo, R. Huang, N. Yan, W. An, K. Ma, and W. Lin*

Synthesis of Sparse Planar Antenna Arrays Using a Matrix Constraints Method . . . . . *K. Miao, Y. Zhang, S. Wang, C. Yao, G. Zhao, and H. Sun*

Design of Low-Profile Single-Layer Angle-Selective Surfaces Based on the First Odd Mode Resonance . . . . . *Z.-X. Wang, X.-H. Yang, Z.-Y. Zong, W. Wu, and D.-G. Fang*

A Refinement and High-Degree Stable Marching-on-in-Degree Method for Wideband Scattering From Perfect Conductors . . . . . *R. Bai, M.-D. Zhu, Y.-D. Wang, D. E. Wen, H. Xie, L. Huang, J. Leng, and W.-Y. Yin*

Fast Pattern Synthesis for Large-Scale Time-Modulated Planar Arrays With a Novel Two-Stage Iterative Convex Optimization Method . . . . . *Z. Zhu, Y. Chen, Y. Feng, and S. Yang*

Reducing the Q Lower Bound for Electrically Small Antennas Using Dispersive Tuning . . . . . *A. D. Yaghjian*

A Miniaturized Dual-Polarized Tri-Band Antenna Based on Multimode and Stacked Scheme for Multiband Aperture-Shared Base-Station Applications . . . . . *Y. Li, W. Yang, Q. Xue, and W. Che*

A Novel Design Method for High-Efficiency Quasi-2-bit Reconfigurable Metasurface Antennas . . . . . *Y.-H. Nam, S.-G. Lee, and J.-H. Lee*

Efficient Antenna Modeling and Optimization Using Multifidelity Stacked Neural Network . . . . . *J. Tan, Y. Shao, J. Zhang, and J. Zhang*

A Simple-Structured Dual-Polarized Staggered Array With Enhanced Isolation at E- and H-Planes . . . . . *R. C. Dai, J. H. Ou, H. Su, and X. Y. Zhang*

Polarization-Correlation-Based Metasurface for Full-Space Independent Amplitude and Phase Modulation . . . . . *Y. Jiao, H. Shi, X. Chen, J. Yi, J. Chen, A. Zhang, Z. Xu, and H. Liu*

High-Gain and Beam-Switchable Multibeam Holographic Metasurface Antenna Array Coated With Phase-Correcting Metasurface . . . . . *P. Wang, Y. Liu, B. Yin, F. Lin, and W. Wang*

On the Relationship Between the Vogler Algorithm Derivation and the Parabolic Equation for Multiple Knife-Edge Diffraction . . . . . V.*-D. Nguyen, H. Phan, O. Y. Chén, A. Mansour, A. Coatanhay, and T. Marsault*

In-Band RCS Reduction Method for the Vivaldi Array Antennas Based on the Manipulation of the Antenna Mode Scattering Field . . . . . *C. Zhao, W. Jiang, W. Hu, and Y. Gao*