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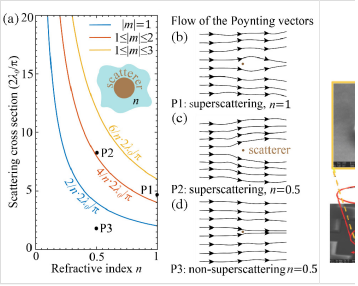

2021-01-01

Call-for-Papers for PIER Special Issues

Being an open access on-line journal, PIER gives great prominence to special issues that draw together significant and emerging works to promote key advances on specific topics. The special issues are devoted to timely, relevant, and cutting-edge research and aim to provide a unique platform for researchers interested in selected topics.We are now calling for papers for the following PIER Spe »

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- **20 June, 2021** --- Abstract Submission Deadline
- **20 August, 2021** --- Pre-registration Deadline
- **25 August, 2021** --- Full-length Paper Submission Deadline
- **20 September, 2021 ---** Preliminary Program
- **5 October, 2021 ---** Advance Program
- **20 October, 2021 ---** Final Program

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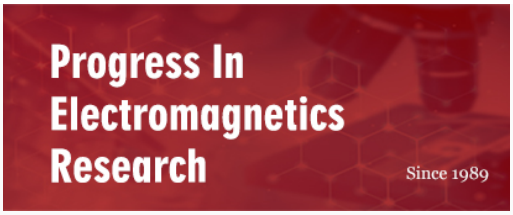
- Superscattering of Light in Refractive-Index Near-Zero Environments
  Chan Wang, Chao Qian, Hao Hu, Lian Shen, Zuo Jia Wang, Huaping Wang, Zhiwei Xu, Baile Zhang, Hongsheng Chen, and Xiao Lin



Progress In Electromagnetics Research

PIER Journals are a family of journals supported by the PhotonIcs and Electromagnetics Research Symposium (PIERS), which has become a major symposium in the area related to photonics and electromagnetics. The scope includes all aspects of electromagnetic theory plus its wide-ranging applications. Hence, it includes topics motivated by mathematics, sciences as well as topics inspired by advanced technologies. The spectrum ranges from very low frequencies to ultra-violet frequencies. The length scale spans from nanometer length scale to kilometer length scale. The physics covers the classical regime as well as the quantum regime.

»

- Second-Order Nonlinear Susceptibility Enhancement in Gallium Nitride Nanowires (Invited)
  Kangwei Wang, Haoliang Qian, Zhaowei Liu, and Paul K. L. Yu
- A Review of Algorithms and Hardware Implementations in Electrical Impedance Tomography (Invited)
  Zheng Zong, Yusong Wang, and Zhun Wei
- One-Way Topological States Along Vague Boundaries in Synthetic Frequency Dimensions Including Group Velocity Dispersion (Invited)
  Qingrou Shan, Danying Yu, Guangzhen Li, Luqi Yuan, and Xianfeng Chen
- Designer Surface Plasmons Enable Terahertz Cherenkov Radiation (Invited)
  Jie Zhang, Xiaofeng Hu, Hongsheng Chen, and Fei Gao
- Multi-Laser Scanning Confocal Fluorescent Endoscopy Scheme for Subcellular Imaging (Invited)
  Xiaomin Zheng, Xiang Li, Qiao Lin, Jiajie Chen, Yueqing Gu, and Yonghong Shao
- Designing Nanoinclusions for Quantum Sensing Based on Electromagnetic Scattering Formalism (Invited Paper)
  Constantinos Valagiannopoulos

Newest Articles

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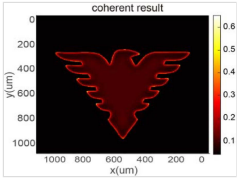


2022-08-22

Deep Learning Approach Based Optical Edge Detection Using ENZ Layers (Invited)

Yifan Shou, Yiming Feng, Yiyun Zhang, Hongsheng Chen, and Haoliang Qian

Metamaterials offer a chance to design films that could achieve optical differentiation due to their special properties. Layered film would be the simplest case considering the easy-fabrication and compactness. Instead of performing the optical differentiation at the Fourier plane, Green-function based multi-layers are used to achieve optical differentiation. In this work, epsilon-near-zero (ENZ) material is utilized to realize the optical differentiation owning to the special optical properties that the reflection increases with the increase of incident angl...

PIER B

ISSN: 1937-6472

2022-08-24

A Review on Metamaterial Application in Microstrip and Substrate Integrated Waveguide Antenna Designs

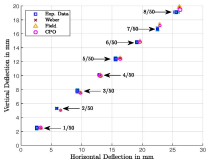
Wriddhi Bhowmik, Bhargav Appasani, Amit K. Jha, and Shweta Srivastava

Metamaterials are artificially configured composite materials exhibiting unique characteristics such as negative effective permittivity and permeability. Due to these distinctive characteristics, metamaterials have drawn special attention in designing novel antenna structures and improving antenna performances. The application of metamaterial in antenna technology significantly brings miniaturization to t...

PIER C

ISSN: 1937-8718

2022-08-29



A Charged Particle Model Based on Weber Electrodynamics for Electron Beam Trajectories in Coil and Solenoid Elements

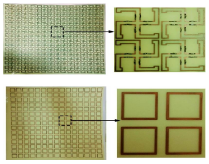
Christof Baumgärtel and Simon Maher

To aid with the design, evaluation, and optimisation of charged particle instrumentation, computer modelling is often used. It is therefore of interest to obtain accurate predictions for trajectories of charged species with the help of simulation. Particularly for solenoids and coils, which are often used for guiding, deflecting or focusing particle beams, knowledge of the magnetic field is required, especially in t...

PIER M

ISSN: 1937-8726

2022-08-23



A Miniaturized Dual-Polarized Band Notched Absorber with Low Insertion Loss

Saurabh Sambhav and Jayanta Ghosh

In this study, a novel, low-profile, polarization-insensitive, and compact band-notched absorber is presented. The objective of the proposed work is to design a miniaturized FSS-based band-notch absorber with high angular stability exhibiting strong operational bandwidth of 130.5% (1.7 GHz to 8.09 GHz). The absorber consists of a reflecting band sandwiched between two absorption bands. The absorption bands l...

PIER Letters

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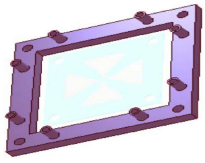
2022-08-26



A Dual-Polarized, Direction Diagram Reconfigurable, Liquid Metal Antenna

Xia Bai, Shan Lv, and Yanju Zhu

In this paper, we present a dual-polarized, pattern reconfigurable, liquid metal dipole antenna. The proposed design consists of a pair of ±45° polarized reconfigurable dipole antennas, two vertically placed feeding structures with filtering branches, and a resin frame for injecting liquid metal to adjust pattern. By introducing the U-shaped structure, a better impedance matching performance is achieved in two bands. T...

ISSN: 1937-8726

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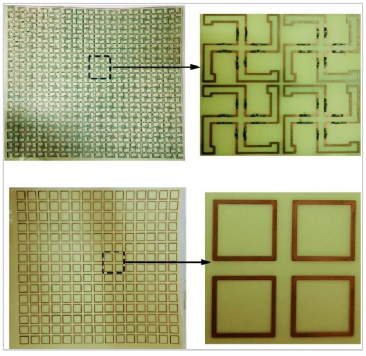
2022-08-23
PIER M
Vol. 112, 231-241, 2022.
doi:10.2528/PIERM22062905

A Miniaturized Dual-Polarized Band Notched Absorber with Low Insertion Loss

Saurabh Sambhav and Jayanta Ghosh

In this study, a novel, low-profile, polarization-insensitive, and compact band-notched absorber is presented. The objective of the proposed work is to design a miniaturized FSS-based band-notch absorber with high angular stability exhibiti...

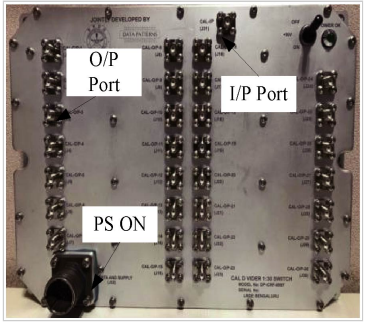


2022-08-17
PIER M
Vol. 112, 217-230, 2022.
doi:10.2528/PIERM22031607

Demonstration and Performance Appraisal of Calibration Network for Multi-Element Calibrati...

Virendra Kumar, Chakkandan Arjunan Sreejith, Shreeshail, Upendra Shankar Pandey, Karukunnel Beenamole, and Ravi Kumar Gangwar

In active phased arrays, T/R module performance drifts due to active components' aging and thermal effect. Hence periodic online field calibration is required during the deployment of a radar system. This paper presents an innovative design of...

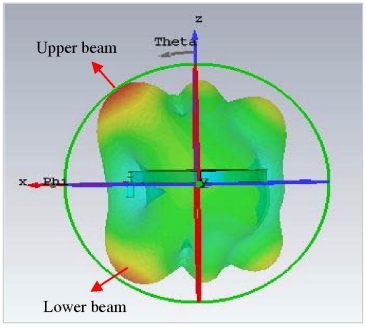


2022-08-11
PIER M
Vol. 112, 205-215, 2022.
doi:10.2528/PIERM22060212

Multibeam One-Third Radial Line Slot Array (RLSA) Antennas

Teddy Purnamirza, Rafiq Abdillah, Mulyono, Sutoyo, Rika Susanti, Muhammad I. Ibrahim, and Depriwana Rahmi

This study aims to develop and evaluate the multibeam one-third Radial Line Slot Array (RLSA) antennas. The various techniques used include: a) slot implementation on the background surface for the design of multibeam, b) cutti...



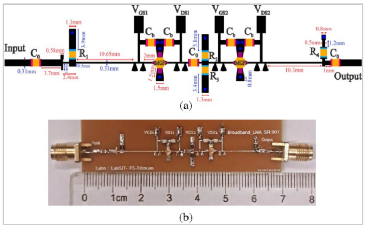
2022-08-07
PIER M
Vol. 112, 191-203, 2022.
doi:10.2528/PIERM22042606

InGaAs HEMT Broadband Microstrip Resistive-Terminated Low Noise Amplifier

Moustapha El Bakkali, Hanae Elftouh, Naima Amar Touhami, Imane Badaoui, and Mohammed Lamsalli

This paper presents the design, co-simulation, and

measurement of a two-stage broadband-cascaded low noise amplifier (LNA) using resistive terminated architecture. This architecture extends the bandwidth of a low-noise amplifi...



2022-08-04
PIER M
Vol. 112, 177-189, 2022.
doi:10.2528/PIERM22062909

Design of a Wideband Spring Textile Antenna for Wearable 5G and IoT Applications Usi...

Bashar Qas Elias and Ping Jack Soh

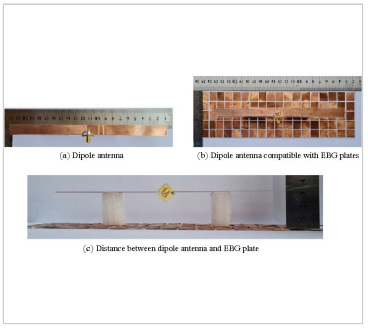
This paper presents the design and practical implementation of a wideband spring textile (WST) antenna for wearable communications. The antenna is designed on a felt substrate having a compact dimension of 32 × 42 × 3 mm^3 (0.38λ_g...

2022-08-04
PIER M
Vol. 112, 163-176, 2022.
doi:10.2528/PIERM22053003

Dipole Antenna with 18×5 Square Electromagnetic Band Gap for Applications Used in Monitori...

Watcharaphon Naktong and Natchayathorn Wattikornsirikul

This article presents the design of the dipole antenna structure in combination with a square electromagnetic band gap (EBG), to detect child trapped in carsuse the 750 MHz frequency range, which responds to the most human moveme...

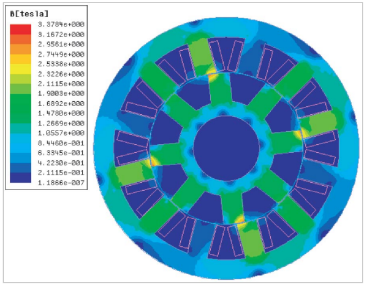


2022-08-04
PIER M
Vol. 112, 151-161, 2022.
doi:10.2528/PIERM22061306

Iron Loss Calculation in Switched Reluctance Motor Based on Flux Integral Path Method

Kuo Li, Aide Xu, Bing Leng, Yang Yang, and Jinghao Sun

In this paper, a new fast and accurate method, the Flux Integral Path (FIP) method, is proposed for switched reluctance motor (SRM) to analyze the iron loss. The magnetic flux generated by the stator poles is integrated over a peri...

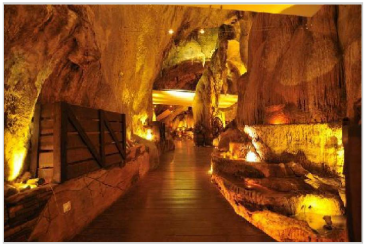


2022-08-04
PIER M
Vol. 112, 139-149, 2022.
doi:10.2528/PIERM22061402

Propagation Measurements and Modelling of Natural Tropical Caves

Qi Ping Soo, Soo Yong Lim, Irfan Farhan Mohamad Rafie, David Wee Gin Lim, Kian Meng Yap, and Sian Lun Lau

Caves are a vital environment with an understudied propagation characteristic to date. In this paper, we investigate the propagation environments of three tourist caves in Malaysia at 900 MHz, 2.4 and 5.8 GHz. Path lo...



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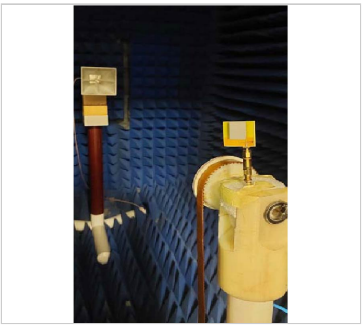
Vol. 112, 127-137, 2022.

A Novel Compact Dual Notch with High-Gain Multi-Layer Dielectric Resonator Antenna for Ultrawide-Band Applications

doi:10.2528/PIERM22061204
Mai Fouad Ahmed, Mona Abdel Ghany Mohamed, Abdel Hamied Abdel Shaalan, and Walid Saber El-Deeb

In this paper, a novel compact high-gain multi-layer dielectric resonator antenna for ultra-wideband applications is designed and fabricated. The proposed antenna employs a new technique to make a notch-band for the frequencies with...



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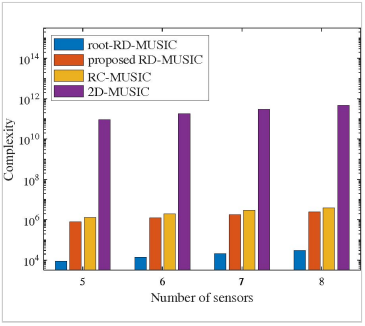
Vol. 112, 115-125, 2022.
doi:10.2528/PIERM22041602

A 2-D DOA Estimation Algorithm for L-Shaped Array with Improved Computational Efficiency

Jie Yang and Hu He

A high-precision and high-efficiency reduced-dimension direction of arrival (DOA) estimation algorithm based on an L-shaped array for the problems of large computation and high cost of achieving two-dimensional (2D) DOA estimation by 2...



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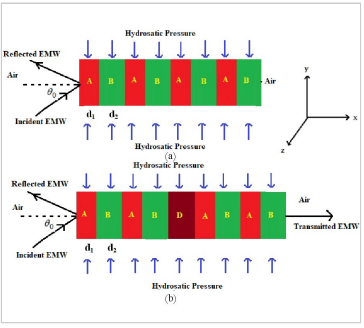
Hydrostatic Pressure Sensor Based on Defective One-Dimensional Photonic Crystal Containi...

Sanjeev Srivastava

In this work, the design of a high sensitivity hydrostatic pressure sensor based on one-dimensional photonic crystal (1DPC) containing polymeric materials has been proposed and investigated, theoretically. The proposed structure consists ...



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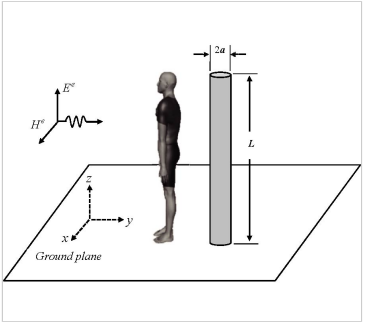
doi:10.2528/PIERM22042402

Transient Thermal Analysis of Human Exposure to Electromagnetic Fields

Abdelmalek Laissaoui, Ammar Abdi, Mezoued Sabrina, Bachir Nekhoul, and Dragan Poljak

The study of the thermal effect caused by exposure to electromagnetic fields is a focus of this research. To quantify the induced current and temperature distribution in the human body an assessment tool for the frequency range of ...



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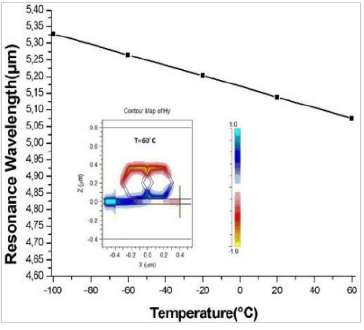
doi:10.2528/PIERM22032604

Design and Analysis of a Mid-Infrared Ultra-High Sensitive Sensor Based on Metal-Insulator-Met...

Hocine Bensalah, Abdesselam Hocini, and Hocine Bahri

In this paper, a compact and highly sensitive refractive index plasmonic sensor, based on a metal-insulator-metal (MIM) waveguide coupled to double hexagonal ring-shaped resonators in the mid-infrared range, is proposed a...



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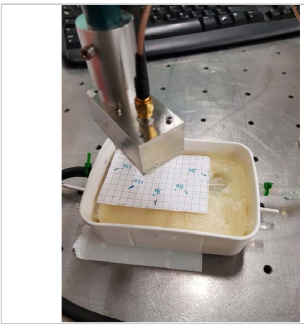
doi:10.2528/PIERM22031401

Experimental Feasibility Study of Using mmWave for Arterial Radial Displacement Monitoring

Somayyeh Chamaani, Teresa Slanina, Duy Hai Nguyen, Jochen Moll, and Viktor Krozer

Doppler Ultrasound as the gold standard for noninvasive arterial pulsation monitoring has limitations such as dependency on the operator and absence of acoustic window in some patients. Recently, mm-wave has been propound...



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Vol. 112, 55-65, 2022.
doi:10.2528/PIERM22050907

Spatiotemporal Localized Waves and Accelerating Beams in a Uniformly Moving Dielectric Medium

Ioannis Besieris

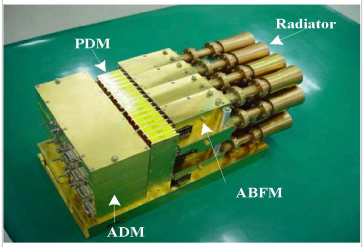
A study is presented of several types of nondiffracting and slowly diffracting spatiotemporally localized waves supported by a simple dielectric medium moving uniformly with speed smaller or larger than the phase speed of light in the rest frame of the medium. The Minkowski material relations are not independent in the case that the speed of motion equals the phase speed ...

2022-07-24
PIER M
Vol. 112, 41-53, 2022.
doi:10.2528/PIERM22052902

Multi-Beam Forming and Optimization for Active Phased Array Antenna Using Genetic Algorithm

Ji-Hoon Bae and Won-Kyu Choi

In this paper, the optimized results of multi-beam forming for an active phased array antenna are presented. In the case of a horn radiator, to implement equal main beamwidths and a low side-lobe level in the principal planes, a circula...



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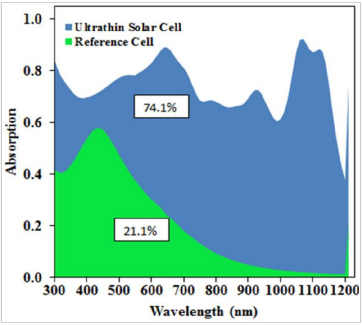
PIER M
Vol. 112, 29-39, 2022.
doi:10.2528/PIERM22020901

Performance of Ultrathin Amorphous Silicon Solar Cells: an Influence of Plasmonic Effect

Sigamani Saravanan and Raghvendra Dubey

Compared to crystalline silicon solar cells, thin-film solar cells are inexpensive, but a weak absorption of sunlight at a longer wavelength is a significant issue. In this perspective, an efficient light trapping mechanism is needed to facilitate t...



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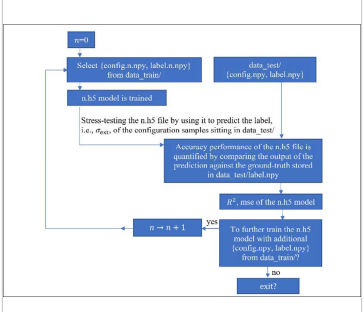
PIER M
Vol. 112, 15-28, 2022.
doi:10.2528/PIERM22050504

A Neural Network Representation of Generalized Multiparticle Mie-Solution

Ying Li Thong and Tiem Leong Yoon

Generalized Lorentz-Mie Theory (GLMT) provides analytical far-field solutions to electromagnetic (EM) scattering of an aggregate of spheres in a fixed orientation. One of the computational codes that implements the GLMT calculation...



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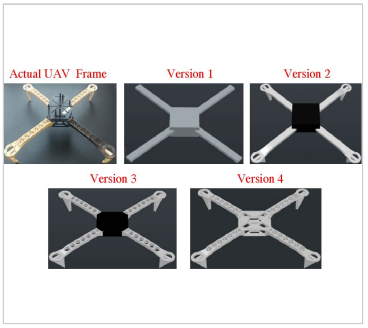
PIER M
Vol. 112, 1-14, 2022.
doi:10.2528/PIERM22062907

Electromagnetic Compatibility Study of Quadcopter UAVs : Characteristic Mode Analysis of the Fram...

Mohamed Z. M. Hamdalla, Jesus M. Roacho-Valles, Anthony Caruso, and Ahmed M. Hassan

The variation in flight attitude, line-of-sight, and speed of unmanned aerial vehicles (UAVs) affect their polarization-dependent coupling cross-section and resultant compatibility to pulsed electromagnetic energy. Here, we present the ou...



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