



SCHOLARLY PUBLICATIONS

School of Electronics Engineering

KIIT Deemed to be University

Journal Name: Results in Engineering

IF: 9.4

Title: Physics-guided machine learning framework for smartphone GNSS multipath detection under real-world class imbalance conditions

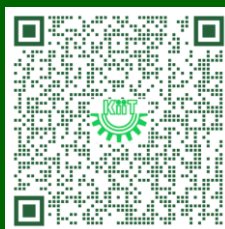
Author: Agarwal K.; Ainapure B.; Shukla A.; Jadhav R.; Sawant T.; Bizon N.; MazÄfre A.G.; Appasani B.

Details: Volume-32, December 2026

Abstract: Smartphone-based GNSS positioning is highly susceptible to multipath interference, a major source of positioning errors of approximately 20–30 m in challenging environments. Unlike high-end GNSS receivers equipped with choke ring antennas and advanced correlators, smartphones lack specialised hardware for multipath mitigation, making software-based detection essential. This study proposes a physics-informed machine learning framework for multipath detection using raw GNSS measurements from the Google Smartphone Decimeter Challenge dataset, collected from multiple Android devices in real-world environments. Ground-truth labels were generated and validated using NovAtel SPAN RTK residual anchors, ensuring physically meaningful supervision without circular feature dependency. The resulting labels achieved a precision of 1.000, recall of 0.912, F1-score of 0.954, and an overall agreement of 92.2%. Five supervised classifiers—Random Forest (RF), Logistic Regression, Support Vector Machine, Gradient Boosting, and Naive Bayes—were evaluated under imbalanced (90:10), moderately balanced (60:40), and fully balanced (50:50) class distributions. RF achieved the best performance in the balanced setting, with an MCC of 0.645, ROC-AUC of 88.57%, and F1-score of 81.47%, outperforming a C/N₀-only baseline by 0.611 MCC points. SHAP analysis identified device encoding, carrier phase smoothness, and Doppler rate anomaly as the most influential features. Leave-one-device-out validation across 20 devices produced a median RF F1-score of approximately 83%, while a physics-only ablation improved generalization to unseen hardware. Integrating predicted multipath probabilities into soft weighted least-squares positioning reduced the median positioning error from 3.71 m to 2.50 m and increased solution availability from 66.2% to 99.2%, demonstrating the practical value of probabilistic multipath mitigation.



URL: <https://www.sciencedirect.com/science/article/pii/S2590123026032159?via%3Dihub>





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Journal Name: Solar Energy Materials and Solar Cell

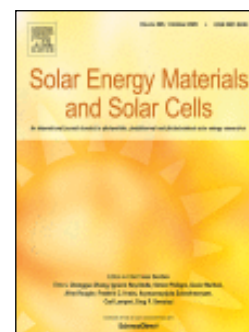
IF: 6.6

Title: Beyond lead halide perovskites: visible light photovoltaics with phase engineered bismuth-based oxide double-perovskites, Bi_2MCrO_6 ($\text{M} = \text{Fe}, \text{Mn}$)

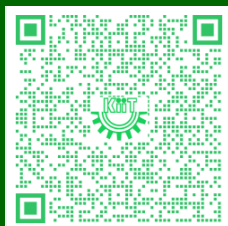
Author: Vikas N.P.; Pradhan R.K.; Mukherjee S.; Singh U.P.; Patra B.K.; Srivastava R.P.; Roy A.

Details: Volume 306, October 2026

Abstract: Lead poisoning and notorious ambient instability in lead-based halide perovskites pave the way for the exploration of alternative materials for affordable and efficient solar cell fabrication. An important prerequisite to this end is the optoelectronic evaluation of the proposed material. Here we report, optoelectronic characterization of $\text{Bi}_2\text{FeCrO}_6$ (BFCO) and $\text{Bi}_2\text{MnCrO}_6$ (BMCO) thin films vis-à-vis performance of photovoltaic cells. Solution-deposited thin films (350-450 nm) of the above compositions demonstrate a double-perovskite structure with monoclinic $\text{P } 2_1/c$ symmetry, albeit with mixed cation valences and deep-level defects. A thorough optoelectronic evaluation exhibits large optical absorption in the visible range ($\alpha \sim 10^4 - 10^5 \text{ cm}^{-1}$), and high carrier density, $\sim 10^{17-20} \text{ cm}^{-3}$. Ultraviolet photoelectron spectroscopy measurement allowed determination of the positions of the band-edges (valence band maximum and conduction band minimum), required for the selection of carrier transport layers. In its first, BMCO-based FTO/ SnO_2 /BMCO/Spiro-OMeTAD/Ag solar cell produced a maximum 3.56% conversion efficiency. Using numerical simulation, we predict that with suitable defect control, the above conversion efficiency can increase significantly.



URL: <https://www.sciencedirect.com/science/article/pii/S0927024826002837?via%3Dihub>





SCHOLARLY PUBLICATIONS

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Journal Name: Discover Sustainability

IF: 5.2

Title: Mapping the evolution of artificial intelligence from automation to augmentation in smart employee management using bibliometric and altmetric analysis

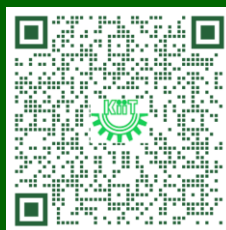
Author: Pattepu S.; Dulla N.; Priyadarshini S.; Panda S.; Appasani B.; Nsengiyumva P.

Details: Volume-7, Issue-1, December 2026

Abstract: The integration of employee engagement with artificial intelligence (AI) has become essential in recent years, driven by the demand for advanced technologies, data-driven-decision-making, and predictive analytics to improve Human Resource (HR) management and performance. This study employs bibliometric, thematic, and content analysis to explore key trends, emerging technologies, and their impact on smart employee management (SEM). Data were extracted from two reputed academic databases Scopus (N = 920) and Web of Science (N = 363) covering the period from 1984- August, 2025. After removing 240 duplicate records, a total of 1,043 articles were analyzed using bibliometric and altmetric tools such as VOSviewer, Biblioshiny, Altmetric Bookmarklet, and Dimensions. The study found that 2021 marked the peak year for a noticeable increase in literature pertaining to SEM with 129 publications and 4,912 citations. From 2019 to 2023, research trends shifted from general subjects such as employment, manufacturing, and business processes to more specialized applications, with a particular emphasis on the role of AI in employee performance, trust and decision-making. Further, the study incorporated altmetric analysis, providing complementary insights by capturing real-time attention and societal impact of globally cited documents. The findings highlighted that while automating repetitive work, building trust, and addressing ethical issues like prejudice and transparency, managers should integrate AI with human skills, placing an equal emphasis on creativity and human-touch. The uniqueness of study stands at triangulating bibliometric, thematic, content and altmetric insights to map scholarly evolution and societal attention to SEM and provide a set of future research directions to advance theory and practice in AI-augmented HR systems.



URL: <https://link.springer.com/article/10.1007/s43621-026-03368-6>





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Journal Name: Utilities Policy

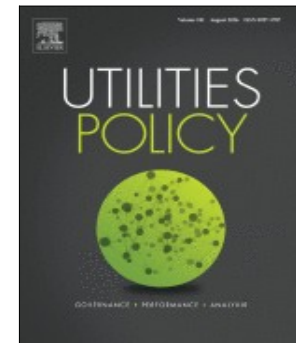
IF: 4.9

Title: Analyzing the evolution of India's electricity market: A systematic review of drivers, barriers, and regulatory instruments

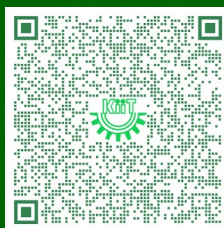
Author: Sahoo, S; Mishra, S; Mishra, DK

Details: Volume-102, 26th October, 2026

Abstract: The global transition toward sustainable power systems, energy security, and economic growth has increased the importance of modern electricity markets worldwide. In India, the electricity sector has undergone a significant transformation since the implementation of the Electricity Act, 2003, shifting from a vertically integrated structure to a more competitive, market-oriented framework. The increasing penetration of renewable energy, rising electricity demand, and continuous regulatory reforms have accelerated the development of short-term electricity markets and market-based mechanisms. This study presents a systematic review of the evolution of India's electricity market, focusing on the major drivers, barriers, and regulatory instruments influencing the sector. The review examines the development of key market segments, including long-term power purchase agreements, power exchanges, the Day-Ahead Market (DAM), Term-Ahead Market (TAM), Real-Time Market (RTM), and emerging green market mechanisms such as the Green Day-Ahead Market (GDAM). The study also analyzes the role of Renewable Energy Certificates (RECs), Energy Saving Certificates (ESCs), Market-Based Ancillary Services (MBAS), and the Carbon Credit Trading Scheme (CCTS) in supporting renewable energy integration and enhancing market flexibility. The findings indicate that, despite considerable progress in electricity market development, challenges such as DISCOM financial stress, transmission congestion, dependence on long-term contracts, and regulatory uncertainties continue to affect market efficiency and liquidity. However, ongoing reforms related to ancillary services, energy storage integration, market coupling, and digital grid modernization are expected to improve the transparency, flexibility, and sustainability of India's future electricity market.



URL: https://www.sciencedirect.com/science/article/pii/S0957178726001256?pes=vor&utm_source=clarivate&getft_integrator=clarivate





SCHOLARLY PUBLICATIONS

School of Electronics Engineering

KIIT Deemed to be University

Journal Name: Micro and Nanostructures

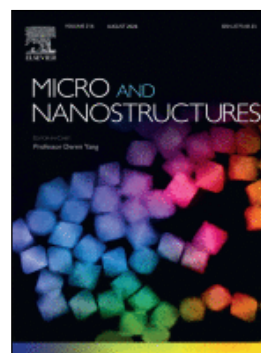
IF: 3.1

Title: Layer-dependent DC, RF, and linearity trade-offs in black phosphorus TFETs

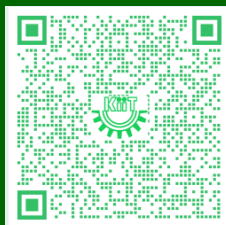
Author: Pahari P.; Mohapatra S.K.; Dastidar A.; Das J.K.; Acharya O.P.; Ray K.

Details: Volume 217, September 2026

Abstract: Black phosphorus (BP) has attracted significant interest for next-generation nano-electronic devices due to its tunable bandgap, high sensitivity to surface charge variations, and strong in-plane anisotropy. Field-effect transistors made of tunnel structures (TFETs) with highly promising channel material have been proposed. The sub-60 mV/dec subthreshold slope operation is highly promising; however, practical deployment in real-world circuits has been hindered by insufficient on-state current and limited RF performance. In this article, a thorough analysis of BP-DG-TFET behaviour as a function of BP thickness from monolayers to five layers has been performed by calibrated TCAD simulations. The analysis has been conducted in terms of DC, transport, RF, and linearity characteristics. It has been found that as BP thickness increases, the bandgap and tunneling barrier width decrease significantly, resulting in marked on-state current, transconductance, gain-bandwidth product, and cut-off frequency improvement from 150 GHz (L4) to ~210 GHz (L5) and up to ~260–280 GHz (bulk) of BP layers. Higher order transconductance, harmonic, and compression ratios have pinpointed that there exists an optimal compromise between gain and linearity within TFETs; in this case, the optimal trade-off is attained by the BP layer TFET. This method also shows that the BP thickness engineering method can be successfully applied as a design technique for the optimal trade-off of DC, RF, and linearity performance, and therefore, BP-DG-TFETs are promising for next-generation low-power analog RF application.



URL: <https://www.sciencedirect.com/science/article/pii/S2773012326002487?via%3Dihub>





SCHOLARLY PUBLICATIONS

School of Electronics Engineering

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Journal Name: AEU - International Journal of Electronics and Communication

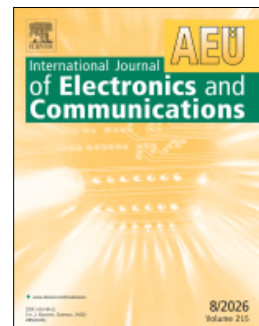
IF: 3.1

Title: Spatially efficient metasurface arrayed MIMO antenna with circular polarization effectiveness for higher U-NII Wi-Fi 6/6E/7 GHz band applications

Author: Ramesh K.; Mohanty A.; Bhowmik W.; Panda J.R.

Details: Volume-217, December 2026

Abstract: This article proposes a spatially efficient metasurface arrayed multiple-input multiple-output (MIMO) antenna with effective circular polarization. The performance parameters and design aesthetics are mainly examined on a single element, demonstrating the potential efficacy of wideband response in top loading of metasurface-unit cell clusters and replicating circular polarization (CP) with sequentially rotational symmetric feeding network (SRSFN). The arrayed design configuration assisted with stacked embodiments, of the first layer functioning as a linked ground reflector (at the bottom) and the top layer asserting SRSFN connected via four coaxial feeds. The second layer is a metasurface array designed to increase overall performance. The densely packed meta-array configuration asserts an absolute minimum inter-element spacing (IES) of $0.07\lambda_0$ (λ_0 = lowest operating wavelength at 5.28 GHz) with >20 dB isolation making it spatially efficient. A prototype antenna has been fabricated and experimentally validated to operate from (5.28 – 8.25) GHz with 44% 10-dB IBW and the CP traces from (5.45 – 8.25) GHz with 40.87% 3-dB ARBW. The co-polarization radiation properties reveal dominating Left-handed circular-polarization (LHCP) radiation of (7.69 – 9.66) dBic boresight gain, potent cross-polarization discrimination and minimal ECC. The anticipated functional parameters and performance outcomes of the proposed MIMO antenna array design finds its suitability for U-NII Wi-Fi 6/6E/7 GHz applications.



URL: <https://www.sciencedirect.com/science/article/pii/S1434841126003523?via%3Dihub>

