Chief Editor's Message

Editorial

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I feel highly privileged to address the preface of the ninth issue of an esteemed journal the Current Natural Science & Engineering (CNS&E), which has gained an overwhelming popularity within a short time. It is well known that today India ranks first in Engineering Institutions infrastructure in the world. To fulfil such a huge demand to quickly publish high quality research papers within 40 days, hence this journal is serving the purpose of a comprehensive interdisciplinary integrated journal at global level to serve the scientific community in a better way. The CNSE is providing a unique platform worldwide to publish new findings of Scientists, Researchers & Engineers involved in the new science creation, research, innovative design, and development for industries in the benefit of the society.

The Current Natural Science & Engineering Journal (CNS&E) is an excellent forum to convey the innovative research findings, latest breakthrough inventions, discoveries, and future research prospects in new science for the welfare of society. Scholarly articles published in peer reviewed CNS&E reveals a well known fact that journal supports scientific fraternity worldwide by providing them with novel innovations/improvements by facilitating the proper directions for additional research, inventions, discoveries. Besides, it also rapidly provides an opportunity to discuss incredibly relevant scientific questions arising from continuously proceeding research areas and, hence, nucleates origin for more reliable and insightful answers to mind-boggling inquisitiveness of researchers.

The CNS&E international journal publishes the finest, cutting edge, Industrial processes and application-oriented peer-reviewed research in the fields of Physical & Engineering Sciences, AI & Computer Science, Energy, Metrology and Standardization, Chemical Sciences, Nuclear and Environmental Sciences, Health Science and Digital Agriculture purely on the basis of scientific validity, novelty with high ethical standards.

The present issue enumerates very critical studies on single crystals emerging in advanced technology effectively owing to their superior physical, optical and electronic properties as they serve as fundamental building blocks in advancing various domains, including optoelectronics, nonlinear optics, laser technology and photonics. The presented work portrays an overview on the seed rotation technique (SRT) description and explores the impact of several parameters on crystal quality, as well as the mechanisms that contribute to defect reduction and enhanced structural integrity. In the present article, it provides a brief discussion on the seed rotation technique used in solution-based crystal growth methods to enhance the size and quality of crystals. It promotes convective mixing within the solution, hence reducing localized temperature variations and facilitating a more uniform thermal environment for the developing crystal. The enhanced thermal

uniformity can indirectly mitigate the negative consequences usually linked to abrupt heat gradients, including strain and fault formation during growth. Rotation also facilitates enhanced crystal symmetry and homogeneity, which are crucial for the performance and reliability of crystals utilized in semiconductor, optical and advanced material applications.

A very important application of E-mode GaN HEMTs have been reported on the preferred device configuration for the use in high power switching applications on p-GaN gate HEMT structure and device geometry to achieve high breakdown voltage for DC to DC power switching applications. Various HEMT device geometrical parameters have been explored as a function of device electrical parameters such as Drain current, threshold voltage Ron and breakdown voltage. The gate -drain spacing of greater than 10 μm is found to be the most critical dimension for achieving high breakdown voltage ~750 V but at the cost of device current handling capability which is found to be decreasing from 960 mA/mm to 900 mA/mm when gate drain spacing of 6um is increased to 10 μm.

In Biomedical application the present study investigates the classification of 12-lead electrocardiogram (ECGs) to detect abnormalities in the heart using three computational techniques. It has been mainly focussed on (1) gradient-boosted ensembling following manual feature extraction, (2) deep learning with stacked autoencoders connected to the output of a multi-layer perceptron (MLP) classifier, and (3) a fusion model combining deep-learning and manually extracted features based on an experiment, which has been conducted using the PhysioNet/Computing in Cardiology Challenge 2020 database, addressing a multi-level classification task involving 27 heartbeat rhythm diagnoses. The best-performing model, merged with handcrafted features with autoencoder-derived features, achieves an average classification accuracy of 30.7% and a challenge metric score of 0.4366.

A comprehensive review explores recent advancements in coplanar waveguide (CPW)-fed antenna design, with a particular focus on performance optimization techniques applicable to 5G and future 6G wireless systems. It provides a roadmap for selecting optimal design combinations tailored to specific wireless standards and platforms. Future research is encouraged to explore reconfigurable structures, AI-driven design automation, transparent and sustainable materials, and energy-harvesting integration for next-generation intelligent antenna systems.The study investigates a wide array of design methodologies including the integration of stubs, slots, strips, corner truncation, substrate engineering, defected ground structures (DGS), defected substrates, metamaterials (MTM), frequency-selective surfaces (FSS), conductor-backed (CB) configurations, modified ground structures (MGS), metal reflectors, and MIMO architectures. A detailed parametric comparison reveals how these approaches significantly enhance key antenna parameters such as impedance bandwidth (up to 181%), gain (up to 13.1 dBi), axial ratio bandwidth, miniaturization (up to 72.7% size reduction), polarization purity, and frequency agility across multiple bands. Applications span 5G/6G mobile, biomedical, IoT, satellite, CubeSat, and vehicular systems. In particular, techniques like MIMO and metamaterial integration deliver high port isolation (≥15 dB), ultra-wideband (UWB) support, and enhanced diversity performance.

News & Views on the Impact of Stress on Education is a guiding factor for the students : Understanding the Consequences and Finding Solutions Stress and education are intricately linked, with the pressure to perform well academically often taking a toll on students' mental and emotional well-being.Chronic stress can have severe consequences on students' cognitive,

emotional, and social development, ultimately affecting their academic achievement and overall quality of life.

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