

Guest editorial

ADVANCED LOW-DIMENSIONAL NANOELECTRONIC DEVICES: PHYSICS AND MODELING

Nanoelectronic devices of various kinds are essential for VLSI circuits. The struggle to follow Moore's law is becoming increasingly difficult and complex, requiring multitudinous novel approaches in order to continue decreasing dimensions of the devices which are already firmly established in the nano-world. As an example, the most advanced state of the art VLSI's (microprocessors) currently can contain more than 50 billion transistors per chip. As far as the actual physical dimensions are concerned, in 2021 the IBM company announced their 2 nm chip.

The efforts behind such achievements are enormous. This special issue on advanced planar nanoelectronics investigates some points of interest related to the physics of such devices, as well as their simulation, thus giving its contribution to the existing trends in this rapidly evolving and constantly expanding field.

On May 19–20, 2021, the IEEE KGEC Student Branch Chapter, in association with Department of ECE, KGEC, technically co-sponsored by IEEE EDS Kolkata Chapter, organized International conference "Devices for Integrated Circuit (DevIC)", held in virtual mode as a measure of precaution against the Covid-19 pandemic. The DevIC 2021 ended being a major international conference in the area of electronic devices for application in integrated circuits, with more than 300 submitted papers. It brought together leading scientists, researchers and industry professionals who shared their information and experiences and discussed practical challenges encountered and solutions adopted related to the latest developments in the area of electronic devices, circuits and VLSI. The conference was dedicated to the design, modeling and simulation of nanoelectronic devices, components, circuits and systems. The acceptance rate for the conference was about 50%, which has shown the stringent quality criteria applied to all contributions. The full proceedings of the conference were published by the IEEE (ISBN: 978-1-7281-9955-9) and can be found at IEEE Xplore.

Selected papers from DevIC 2021 were used as a loose inspiration for writing extended and modified and amended manuscripts with qualitatively new results for this Special section of *Facta Universitatis Series: Electronics and Energetics*. Thus the articles published here had been specifically written for this Special Section, being loosely based on the corresponding DevIC 2021 presentations. Each newly produced manuscript was subject to a rigorous peer reviewing procedure in which two or three reviewers from different countries were engaged.

Five papers altogether were selected for this Special Issue. The chosen articles are the following

1. Dhananjaya Tripathy, Debiprasad Priyabrata Acharya, Prakash Kumar Rout, Sudhansu Mohan Biswal, "Influence of Oxide Thickness Variation on Analog and RF Performances of SOI FINFET"

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2. Remya Jayachandran, K. J. Dhanaraj, P. C. Subramaniam, "Planar CMOS and Multigate Transistors Based Wide-Band OTA buffer amplifiers for heavy resistance load"
3. Surajit Bosu, Baibaswata Bhattacharjee, "All-Optical Frequency Encoded Dibit-Based Parity Generator Using Reflective Semiconductor Optical Amplifier With Simulative Verification"
4. Bibek Chettri, Abinash Thapa, Sanat Kumar Das, Pronita Chettri, Bikash Sharma, "First Principle Insight Into Co-Doped MoS₂ For Sensing NH₃ and CH₄"
5. Pranati Ghoshal, Chanchal Dey, Sunit Kumar Sen, "Realization of a Modified 8-Bit Semiflash Analog To Digital Converter Based on Bit Segmentation Scheme"

The Guest Editors hope that the high quality of the papers included in this issue will encourage young authors to present their own achievements. The greatest pleasure for the editors would be to see new publications inspired by this Special Section.

The guest editors would like to express their gratitude to all of the authors who ensured the existence of this Special Issue through their excellent contributions. The gratitude also extends to the organizers of the DevIC 2021 who assembled such a choice group of world-class researchers, to FUEE Editor-in-Chief, Prof. Danijel Danković, as well as to the late member of the Serbian Academy of Sciences and Arts, Prof. Ninoslav Stojadinović, who, before his untimely death, initiated and outlined the work on this Special Section, in cooperation with the General Chair of DevIC 2021, prof. Dr. Anguman Sarkar.

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