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EIRTM 2026
European Congress on Interdisciplinary Research in Technology and Management
In association with EMLV – The Leonard De Vinci Business School, Paris, France and ESILV – Ecole Supérieure d'Ingénieurs, Léonard de Vinci, Paris, France
Venue: The Photovoltaic Institute of Île-de-France, Paris
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About EIRTM 2026

European Congress on Interdisciplinary Research in Technology and Management (EIRTM, 2026) is a distinguished annual academic event that brings together scholars, researchers, and professionals from around the world to share insights and advancements in the fields of technology, innovation, and management.

Under this collaborative banner, there are 3 major Conferences,

One being Engineering Conference, titled "International Conference on Emerging Computing & Innovative Technologies" (ICECIT, 2026 – Paris, Europe).

🧠 ICECIT 2026 (Engineering)

The 2nd one being Management Conference, titled "International Conference on Economics, Business and Management" (ICEBM, 2026 – Paris, Europe).

💼 ICEBM 2026 (Management)

The 3rd one being Science Conference, titled "International Conference on Emerging Trends in Physical Sciences and Sustainability" (ICETPS, 2026 – Paris, Europe).

💼 ICETPS 2026 (Science)

Important Deadlines

Final Paper Submission:
15th April, 2026

Acceptance Notification:
15th April, 2026

Registration:
17th April, 2026

Paper Presentation Submission:
20th April, 2026

Conference:
21st-23rd April, 2026

Performance Analysis of Dual Metal Gate Vertical FET Incorporating Dielectric Engineering

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Abstract. This work focuses on a Double Metal Double Gate Vertical Field Effect Transistor (DMDG-VFET) architecture, where certain key design characteristics were employed to achieve optimized device performance. The proposed structure employs (i) a vertical device configuration and (ii) a dual metal gate layout, where nickel (Ni) and silver (Ag) were incorporated to introduce work-function engineering for improved carrier transport, to enhance electrostatic control and reduce short-channel effects. The energy band profiles, electric field distribution, and transfer characteristics of the device were investigated by simulations using Silvaco TCAD (version 5.26.1.R). The oxide layer between the gate electrodes and the channel region was composed of dielectric materials such SiO_2, SiO_3N_4, AlO_2O_3, and HfO_2. HfO_2 demonstrated superior electrostatic control by virtue of its high dielectric constant. Results illustrated stronger band bending, highest ON and OFF current and the I_{ON}/I_{OFF} ratio was observed to significantly increase for HfO2. The obtained results emphasise upon the significance of dielectric engineering in enhancing the switching characteristics of vertical FET devices, indicating future low-power semiconductor functionalities of the proposed device.

1 Introduction

In accordance to Moore's Law, continuous scaling of semiconductor devices has greatly enhanced performance and density of devices. However, serious concerns like high power dissipation, short - channel effects and increased leakage current persist. To mitigate these disadvantages, switching devices with higher energy efficiency have been investigated. For low power electronic applications, Tunnel Field Effect Transistors (TFETs) were found suitable [1], as they could achieve subthreshold swing values lower than the thermionic limit of 60mV/decade

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11. S. Gupta, S. Wairya, S. Singh, Analytical modeling and simulation of a triple metal vertical TFET with hetero-junction gate stack. Superlattices Microstruct. **157**, 106992 (2021). https://doi.org/10.1016/j.spmi.2021.106992
12. G. Wadhwa, J. Singh, B. Raj, Design and investigation of doped triple metal double gate vertical TFET for performance enhancement. Silicon **13**, 1839–1849 (2021). https://doi.org/10.1007/s12633-020-00585-0
13. S. Singh, A. Verma, J. Singh, G. Wadhwa, Investigation of N^+ SiGe gate stacked V-TFET based on dopingless charge plasma for gas sensing application. Silicon **14**, 6205–6218 (2022). https://doi.org/10.1007/s12633-021-01416-6
14. I. Maity, A. Majumdar, S. Maity, I. Maity, An in-depth analytical approach to unfold material-level insights in pristine and platinum-doped $MoSe_2$ nanosheet during carbon monoxide detection. J. Act. Passiv. Electron. Devices **19**, 217–238 (2025).

[ICETPS 2026] Your paper #1571270977 ('Performance Analysis of Dual Metal Gate Vertical FET Incorporating Dielectric Engineering')

From:
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To: Sarthak Karmakar Sarthak.Karmakar2023@iem.edu.in, Sneha Banerjee Sneha.Banerjee2023@iem.edu.in, Souhardya Ray ray.souhardya05@gmail.com, Arkya Nandy arkya.nandy2004@gmail.com, Tanit Ghosh tanitgh24@gmail.com, Sneha Pandey snehapandey835@gmail.com, Malay Ganguly malay.ganguly@iem.edu.in, Indranil Maity indrnilmaity026@gmail.com
Sent: Wednesday, April 1 at 12:45 PM

Dear Mr. Sarthak Karmakar:

Congratulations - your paper #1571270977 ('Performance Analysis of Dual Metal Gate Vertical FET Incorporating Dielectric Engineering') for ICETPS 2026 has been **accepted** and will be presented in the session titled __.

The reviews are below or can be found at 1571270977.

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Detail Review Report (EIRTM 2026)-: Select an option from following

Accept (4)

Comments for reviewers: write at least 100 words regarding this review

The proposed dual-metal double-gate vertical architecture effectively enhances electrostatic control and mitigates short-channel effects, as supported by TCAD-based analysis of energy bands, electric fields, and transfer characteristics . The comparative evaluation of dielectric materials (SiO_2, Si_3N_4, Al_2O_3, HfO_2) is rigorous, with HfO_2 showing significant improvement in ION/IOFF ratio and switching behavior, indicating strong technical contribution and novelty

EIRTM 2026 2

Detail Review Report (EIRTM 2026)-: Select an option from following

Accept (4)

Comments for reviewers: write at least 100 words regarding this review

The use of Silvaco TCAD along with well-established physical models (drift-diffusion, SRH recombination, Fermi–Dirac statistics) adds credibility and robustness to the analysis

The dual-metal double-gate vertical configuration significantly improves electrostatic control and reduces short-channel effects, as demonstrated through detailed TCAD simulations of energy bands, electric fields, and transfer characteristics

Regards,
The conference chairs

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SUMMARY

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Thanks and Regards,

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