**Open Review**

(x) I would not like to sign my review report  
( ) I would like to sign my review report

Quality of English Language

( ) I am not qualified to assess the quality of English in this paper  
( ) English very difficult to understand/incomprehensible  
( ) Extensive editing of English language required  
( ) Moderate editing of English language required  
( ) Minor editing of English language required  
(x) English language fine. No issues detected

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|  | Yes | Can be improved | Must be improved | Not applicable |
| Does the introduction provide sufficient background and include all relevant references? | (x) | ( ) | ( ) | ( ) |
| Are all the cited references relevant to the research? | (x) | ( ) | ( ) | ( ) |
| Is the research design appropriate? | (x) | ( ) | ( ) | ( ) |
| Are the methods adequately described? | (x) | ( ) | ( ) | ( ) |
| Are the results clearly presented? | (x) | ( ) | ( ) | ( ) |
| Are the conclusions supported by the results? | (x) | ( ) | ( ) | ( ) |

Comments and Suggestions for Authors

The author present simulation results obtained using TCAD tools for a 3-D silicon on insulator (SOI) n-FinFET structure with various functionally graded materials (FGMs) as gate 11 dielectric, with a gate length of 14 nm at 300K.  Their results may provide versatile opportunities for optimizing FinFET de- 34 vices. However, I would recommend that the author complete a bit of revision before considering accepting the altered paper.

1. The introduction of the paper is well-written, providing a clear overview of the study. However, there is room for improvement in the organization of the content. Consider restructuring the paper to enhance the flow and coherence between sections.
2. The paper lacks details regarding the simulation methodology and parameters used in SILVACO ATLAS. Provide a more comprehensive explanation of the simulation setup, including the specific parameters, conditions, and any assumptions made during the simulations.
3. The fonts in the chart and the table below should be harmonized.
4. Some related studies should be cited, such as *Nature* 603, 259–264 (2022), Research (2022) 2022, 9843268. *Nat Commun* 11, 1205 (2020). Nano Energy (2022) 95, 106986, which are suggested for better understanding for Sensors.
5. Please refer to the experimental article for a comparison of how the simulated device performance compares to the actual device performance.

Please address these comments in your revised manuscript. Once the revisions are complete, I recommended this paper could be ready for acceptance.

Submission Date

08 February 2024

Date of this review

23 Feb 2024 21:58:29