**pen 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  
(x) English very difficult to understand/incomprehensible  
( ) Extensive editing of English language required  
( ) Moderate editing of English language required  
( ) Minor editing of English language required  
( ) 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

This work presents a meticulous simulation using TCAD for FinFET to explore new gate dielectric with various functional graded materials. The work lacks comprehensive reviews and a clear picture of their innovation compared to the existing literature on the similar topic. The simulation results lack new implications that can be used for actual experimental. No direct comparisons were made to any existing literature.

Due your comments, we actually we have rewritten the title, abstract and introduction from the beginning. As our work is concentrated on staged dielectrics and our main contribution is k-grading of these staged nanometer scaled structures. There are many works in the literature that adds arbitrary dielectric laminates on top of each other between Si channel and gate metal. We it appears no example in kappa grading of such structures, also there is no mention about usage of such graded dielectrics on FinFETs

Our work is unique:

* On kappa grading
* On finding the effective dielectric constant of the overall stacked dielectric structure of nanometer scale.
* On finding the effective dielectric constant of nanometer thickness

The written English in this manuscript is extremely bad. Suggestion of inviting a proficient/native English speaker for proofreading and revision is necessary. The formatting of figures and tables is also very unprofessional. Many figures are simply screenshots from their simulation results. Lacking professionalism for publication in journals. And therefore the paper is suggested to be rejected in its current form.

More detailed points are listed below -

In the introduction part, the motivation of the FGM should be introduced as the very first part with the state of art literature.

Line 53-58 - what is the point of making such complicated profiles? Did other researchers have tried before? Please justify.

K-graded stacked gate oxides tend to minimize interface traps so that

The whole introduction part lacks (1) clear motivation for the exploration of FGM structures. (2) comprehensive description/review of the state of art of existing research regarding FGM (eg, double, tri-gate, etc). (3) and therefore it is very unclear what are the innovations that the authors have made to their research work in this manuscript. A complete rewriting is required for the coherence of the actual results described later in the manuscript.

Line 89-90 - The authors claim that they want to prove FGM gate oxide is better than single material dielectric using the simulation. However, according to the older literature, this is already something explored and therefore I don't see a clear innovative point in the method here. Authors should justify their major difference/innovation compared to the literature exploring FGM before. The ultimate question is - what is new?

Figure 3 - Fonts and formulas are way too small for publication figures. Please fix.

Equations have to be associated with their own labels.

The formatting of the tables has to be consistent.

Table 5 seems redundant to show.

Does the FOM suggested in Eq(4) have any recognition inside of the community of FinFET? Is there an existing FOM that the field has used? Please justify.

Figure 6 - Figure 7 - clearly, the authors simply use screenshots as Figures with very hard-to-read fonts, which is very unprofessional and disrespectful to editors and reviewers.

The results are simply large datasets by playing with many parameters. It is unclear what the clear outputs are and no new implications were reviewed from the simulation data. Many conclusions are predictable from knowledge.

Comments on the Quality of English Language

Extremely poor.

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