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REVIEWER'S REPORT

Manuscript No.: IJAR- 58479

Title: SRIM-Based Investigation of Heavy-Ions 238U, 132Xe, 84Kr, 56Fe and 40Ar Energy Loss and Penetration in Silicon devices

Recommendation:
Accept

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality		Yes		
Clarity	Yes			
Significance		Yes		

Reviewer Name: Dr. Ashish Yadav

Detailed Reviewer's Report

Reviewer's Comment for Publication.
Acceptance Comments are mentioned below suitable for the paper titled "SRIM-Based Investigation of Heavy-Ions 238U, 132Xe, 84Kr, 56Fe and 40Ar Energy Loss and Penetration in Silicon devices"

Reviewer Comments: Manuscript Accept

Reviewer Comments –

1. Introduction

The introduction clearly establishes the significance of studying radiation effects in silicon devices used in electronics, photovoltaics, and aerospace systems. It appropriately explains the importance of heavy-ion interactions and distinguishes between electronic and nuclear stopping mechanisms. The motivation for employing SRIM as a simulation tool is adequately justified. However, the introduction could be strengthened by briefly highlighting recent advancements in radiation-hardened semiconductor technologies and explicitly identifying the research gap that the present study aims to address.

2. Literature Review

The literature review covers the fundamental concepts of ion stopping power and previous applications of SRIM in semiconductor research. The cited studies provide an adequate background on radiation-induced damage mechanisms. Nevertheless, incorporating a few recent publications (2023–2026) related to silicon radiation effects, advanced semiconductor materials, or comparative simulation studies would enhance the novelty and demonstrate how the current work extends existing research.

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3. Solution Approach

The methodology is well organized and clearly explains the use of SRIM simulations for evaluating the stopping power and penetration depth of five heavy ions in silicon. The selection of uranium, xenon, krypton, iron, and argon provides a comprehensive comparison across different ion masses. The simulation approach is scientifically sound and reproducible. Including additional simulation parameters such as ion incidence angle, silicon density, crystal orientation, and SRIM input settings would further improve the reproducibility of the study.

4. Results and Discussion

The results are presented systematically and effectively compare the electronic stopping, nuclear stopping, and projected range of the selected heavy ions. The discussion successfully explains the transition between electronic and nuclear energy loss mechanisms and their implications for defect formation in silicon devices. The graphical representations support the analysis and facilitate interpretation. The discussion could be further enriched by comparing the obtained trends with previously reported experimental or simulation results and by elaborating on the practical implications for semiconductor device design and radiation-hardening strategies.

5. Conclusion

The conclusion appropriately summarizes the major findings and highlights the significance of SRIM simulations in understanding heavy-ion interactions with silicon. It clearly emphasizes the dominance of electronic stopping at higher energies and nuclear stopping at lower energies, along with their influence on penetration depth and defect generation. The conclusion would be more impactful if it briefly discussed the practical applications of the findings in space electronics, nuclear instrumentation, and photovoltaic systems, while also suggesting future work involving experimental validation or simulations for emerging semiconductor materials such as SiC or GaN.