Review Form 3

Journal Name:	**Advances in Research**
Manuscript Number:	**Ms_AIR_126555**
Title of the Manuscript:	**Overview of Microscopic Modeling Methods and Applications of Steel Fiber Reinforced Concrete**
Type of the Article	**Opinion Article**

Review Form 3

PART 1: Review Comments

Compulsory REVISION comments	**Reviewer's comment**	**Author's Feedback** *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	This manuscript provides an insightful overview of microscopic modeling methods for steel fiber-reinforced concrete (SFRC), with a focus on finite element, discrete element, and computational fluid dynamics (CFD) models. Its detailed analysis of SFRC's microstructural behavior and limitations fills a critical gap in understanding SFRC's mechanical and flow characteristics at the microscale. This study's relevance to structural engineering is high, as it explores innovative modeling approaches that can aid in optimizing SFRC for practical engineering applications, such as improving tensile strength and crack resistance in complex load-bearing structures. Additionally, the article identifies future research directions, which can stimulate further advancements in this area, making it a valuable reference for both researchers and engineers in materials science.	
Is the title of the article suitable? **(If not please suggest an alternative title)**	The title, *"Overview of Microscopic Modeling Methods and Applications of Steel Fiber Reinforced Concrete,"* is generally appropriate as it reflects the content's focus on various modeling techniques for steel fiber-reinforced concrete (SFRC) at a micro-level. However, it could be more specific to highlight the primary modeling methods and their role in predicting SFRC's mechanical and structural behavior. A refined title could be: "Microscopic Modeling Techniques for Steel Fiber Reinforced Concrete: Applications and Future Directions" This alternative emphasizes the article's focus on modeling techniques and suggests an exploration of future developments, making it more engaging for readers interested in both current and prospective advancements in SFRC modeling.	
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.	**The abstract provides a solid overview of the article's focus on micro-modeling methods for steel fiber-reinforced concrete (SFRC), outlining key modeling approaches like finite element, discrete element, and computational fluid dynamics. It also briefly mentions the applications and limitations of these models, along with future directions, which is useful for readers.** **However, a few additions could make the abstract more comprehensive:** **1. Mention Specific Applications: Highlighting specific applications of SFRC (e.g., in high-stress environments or load-bearing structures) could increase the abstract's practical appeal.** **2. Key Findings or Observations: Including any main findings or unique insights about SFRC modeling (such as how different models handle specific stress or crack propagation) would add value.** **3. Clarification of Limitations and Future Directions: Providing brief examples of limitations and intended improvements could make the future directions more concrete for the reader.** **Suggested revision:** ***"This article reviews micro-modeling methods for steel fiber-reinforced concrete (SFRC), including finite element, discrete element, and computational fluid dynamics approaches, to analyze its mechanical and structural behavior. The models offer predictive insights on stress response, crack propagation, and durability in SFRC, particularly in high-stress structural applications. This study discusses the limitations of current modeling practices, such as high computational demand and parameter determination challenges, and suggests future improvements to enhance simulation accuracy and scalability. This review aims to support the advancement of SFRC in structural engineering applications."***	
Are subsections and structure of the manuscript appropriate?	**The manuscript's structure, with sections dedicated to different modeling methods (finite element, discrete element, and computational fluid dynamics) and their applications, is largely appropriate. The division into distinct subsections allows for a clear, systematic exploration of each modeling technique, making it easy for readers to follow.** **However, a few adjustments could enhance the clarity and depth of the manuscript:** **1. Introduction and Background: Ensure the *Introduction* comprehensively covers the**	

	necessity and unique benefits of using SFRC in engineering applications before diving into specific modeling methods. This provides context for readers unfamiliar with SFRC's role in structural engineering. 2. Limitations and Future Directions: Consider organizing limitations and future research recommendations into a separate *Discussion* section. This can help readers better understand the current challenges and advancements needed without interrupting the flow of the modeling discussion. 3. Applications as a Dedicated Section: Expanding the *Applications* section into its own main section could allow for a more detailed discussion of where each model is practically useful and could support better structure for applied engineering contexts. 4. Concluding Remarks: Adding a brief *Conclusion* to summarize key points and takeaways would round off the manuscript well, providing readers with a concise overview of the study's implications. These adjustments would refine the manuscript's readability and ensure a balanced focus on theory, application, and future directions.	
Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.	The manuscript demonstrates scientific correctness and technical robustness by grounding its review of SFRC modeling methods in well-established numerical simulation techniques such as finite element, discrete element, and computational fluid dynamics. Each method is explained with relevant theoretical foundations, parameters, and mechanical models that align with current scientific understanding in materials science. Furthermore, the manuscript appropriately addresses the limitations and assumptions within each modeling approach, which enhances the accuracy and reliability of its findings. By including recent advancements and detailing challenges in meso-modeling for SFRC, the manuscript provides a balanced and scientifically sound analysis valuable to the field.	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. :	The manuscript includes a substantial and generally appropriate list of references, with several recent sources from 2022 and 2023, reflecting current research on steel fiber-reinforced concrete (SFRC) modeling. These references provide a solid foundation for the topics covered, particularly in finite element and discrete element methods. However, a few additional references could strengthen the review: 1. Multi-scale Modeling in SFRC: Including recent studies on multi-scale approaches in SFRC modeling could enrich the discussion on future directions and model improvement. 2. Advances in Computational Fluid Dynamics for SFRC: More recent articles on CFD in fiber-reinforced concrete applications could provide further depth in the fluid dynamics section, particularly on flow behavior and fiber orientation under different construction conditions. 3. Validation of Numerical Models: References on experimental validation of numerical models (particularly SFRC under various load conditions) could reinforce the discussion on the reliability of these methods. Adding these sources would enhance the article's coverage of cutting-edge techniques and validation practices, offering readers a more comprehensive overview of advancements in SFRC modeling.	

Review Form 3

Minor REVISION comments **Is the language/English quality of the article suitable for scholarly communications?**	The language quality of the article is generally suitable for scholarly communication, with clear technical explanations and appropriate terminology for the field of materials science and engineering. However, some sections could benefit from refinement to improve readability and precision: 1. **Clarity and Conciseness**: Certain sentences could be rephrased for conciseness, especially in technical descriptions, to ensure that complex ideas are presented as clearly as possible. 2. **Grammar and Syntax**: Minor grammar and syntax adjustments would enhance the flow and professionalism of the writing. Attention to subject-verb agreement, article usage, and punctuation would also improve readability. 3. **Terminology Consistency**: Ensuring consistent terminology, particularly for modeling techniques and material properties, would strengthen the manuscript's cohesiveness and readability. Overall, the language is sufficiently professional, but these refinements could make the manuscript even more accessible and engaging for scholarly audiences.	
Optional/General comments	1. **Clear Objectives**: The manuscript could benefit from a more explicit statement of objectives in the *Introduction* to clarify what this review aims to accomplish. A clear purpose will help readers understand the intended contributions to SFRC research and modeling. 2. **Comparative Analysis of Modeling Methods**: While each modeling method is discussed individually, a comparative analysis table or summary could provide added value. Summarizing the strengths, limitations, and ideal applications of finite element, discrete element, and CFD methods side-by-side would help readers grasp the most appropriate contexts for each approach. 3. **Practical Implications**: The article could be enhanced by elaborating more on the practical implications of SFRC modeling. For instance, discussing how different modeling approaches can influence structural design decisions would help bridge the gap between theoretical modeling and real-world applications. 4. **Future Directions**: The *Future Directions* section is insightful, but could include specific examples of advancements (e.g., AI-driven modeling, hybrid simulation methods) that could address current limitations. This would give readers a clearer sense of emerging opportunities in SFRC modeling. 5. **Visual Aids**: Including diagrams, flow charts, or example models could improve comprehension, especially when describing complex modeling methods and parameter selection processes. Incorporating these suggestions could enhance the manuscript's clarity, relevance, and appeal to both researchers and practitioners in the field.	

PART 2:

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	

Reviewer Details:

Name:	**Zeeshan Ullah**
Department, University & Country	**NUST University, Pakistan**