Review Form 3

Journal Name:	**Asian Journal of Physical and Chemical Sciences**
Manuscript Number:	**Ms_AJOPACS_127516**
Title of the Manuscript:	**Performance evaluation of a hight-pass finned air collector: Numerical and experimental investigation**
Type of the Article	**Research Article**

General guidelines for the Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty'**, provided the manuscript is scientifically robust and technically sound.
To know the complete guidelines for the Peer Review process, reviewers are requested to visit this link:

https://r1.reviewerhub.org/general-editorial-policy/

Important Policies Regarding Peer Review

Peer review Comments Approval Policy: https://r1.reviewerhub.org/peer-review-comments-approval-policy/
Benefits for Reviewers: https://r1.reviewerhub.org/benefits-for-reviewers

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, focused on evaluating the performance of a high-pass finned solar air collector, is significant for the scientific community, particularly for advancing solar thermal energy applications. Its detailed theoretical and experimental approach provides valuable insights into improving heat transfer efficiency, making it highly relevant for sustainable energy solutions. I appreciate the comprehensive analysis, which compares theoretical and experimental results, offering a robust validation of the proposed design's effectiveness. Integrating innovative fin structures to enhance thermal performance demonstrates practical applications, benefiting researchers and practitioners in renewable energy and drying technologies. Overall, the manuscript contributes meaningfully to optimizing solar air collectors and their potential uses in energy-efficient systems.	
Is the title of the article suitable? **(If not please suggest an alternative title)**	The current title, "Performance evaluation of a high-pass finned air collector: Numerical and experimental investigation," is descriptive and provides a clear idea of the article's content. However, it could be refined to make it more engaging and precise.	

Review Form 3

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 an overview of the study, outlining the theoretical and experimental focus, the need for improving solar air collectors, and the main findings regarding efficiency. However, it could be more comprehensive and structured by addressing the following points: Suggestions for Improvement: ○ Context and Relevance: Briefly state why solar air collectors are essential, emphasizing their role in renewable energy and sustainability. Highlight the specific problem addressed (e.g., inefficiency in heat transfer) in more detail. ○ Methods: Mention the methodology concisely, such as using fins to enhance turbulence and heat exchange. Specify the experimental setup or simulation approach, like the MATLAB model or data acquisition system. ○ Key Findings: Provide more details on how the efficiency compares to other designs and its practical implications. Highlight the study's unique or innovative aspects, such as the particular fin design or hybrid dryer application. ○ Conclusions and Impact: Include a statement on the broader implications of the findings, like potential applications in drying processes or energy-efficient technologies.	
Are subsections and structure of the manuscript appropriate?	The manuscript has a clear structure with relevant subsections, but there are areas where the organization and headings could be refined for better flow and readability. **Suggestions for Improvement** 1. Section Titles: ○ Some section titles are generic (e.g., "Mathematical Formulation," "Experimental Environment"). Refining them to reflect content better can improve clarity. ▪ Example: "Mathematical Formulation" could be "Thermal Modeling and Energy Balance Equations." ▪ Example: "Experimental Environment" could be "Experimental Setup and Testing Conditions." 2. Subsections: ○ The manuscript lacks consistent subsections under major sections. Breaking long sections into smaller, focused subsections could enhance readability. For example: ▪ "Mathematical Formulation" can have subheadings like: ▪ Energy Balance Equations ▪ Heat Transfer Coefficients ▪ Loss Coefficients ▪ Efficiency Calculations ▪ "Experimental Environment" can include: ▪ Solar Collector Design ▪ Measurement Instruments and Protocols ▪ Data Acquisition and Processing 3. Introduction Section: ○ Include a more detailed overview of the research gap and objectives to set the stage for the study. For instance, specify why fin designs are crucial and highlight the limitations of existing systems. 4. Results and Discussion: ○ Merge or reorganize "Results" and "Discussion" to avoid redundancy. For example, combine insights from the "Performance Comparison" with the analysis of collector efficiency. Use subheadings like: ▪ Comparison of Theoretical and Experimental Results ▪ Temperature Variations and Efficiency Trends 5. Figures and Tables: ○ Ensure figures and tables are well-integrated within the text, with clear references and discussions in relevant sections. 6. Conclusion: ○ Expand the conclusion to briefly restate findings, their implications, and possible future work.	
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.	This manuscript demonstrates scientific robustness and technical soundness by employing theoretical modelling and experimental validation, ensuring a comprehensive approach to evaluating the solar air collector's performance. Using established energy balance equations, heat transfer coefficients, and numerical methods like finite difference modelling aligns with recognized scientific practices. Additionally, the experimental setup is well-documented, with appropriate instrumentation and rigorous data acquisition protocols, enhancing the reliability of the results. The comparison of theoretical and experimental outcomes, alongside references to previous studies, further supports the manuscript's credibility and provides a solid foundation for its conclusions. This integration of theory and experimentation ensures the study's findings are both reliable and applicable.	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. **-**	To enhance the manuscript's relevance and demonstrate alignment with recent advancements, it is essential to include more up-to-date references, particularly from the last 10 years. Here is a curated list of suggested references, including a few from recent years and journals relevant to the topic of solar air collectors and thermal efficiency	

Review Form 3

Minor REVISION comments **Is the language/English quality of the article suitable for scholarly communications?**	The language and English quality of the article are adequate for scholarly communication, but there are areas where improvement would enhance clarity and professionalism. Proofread the manuscript thoroughly for grammatical issues and typos. If possible, use professional editing tools or services to ensure the language aligns with scholarly standards. Incorporate more precise phrasing to enhance the clarity and impact of key findings. By addressing these points, the manuscript can meet the high linguistic standards required for scholarly communication	
Optional/General comments	**Title and Abstract** 1. The title is descriptive but could be made more engaging. Consider highlighting the innovative aspects of the study, such as finned designs or hybrid applications. 2. The abstract should provide a clearer context for the study's relevance and address the research gap more explicitly. 3. Include a summary of the methodology in the abstract to give readers a better understanding of the study approach. 4. Highlight the practical applications of the findings in the abstract, particularly their relevance to solar energy and drying technologies. **Introduction** 5. Expand the introduction to provide a more detailed background on the significance of solar air collectors and their applications. 6. Clearly define the research gap and justify the need for the study. 7. Include more recent references (from the past 5–10 years) to show alignment with current research trends. **Literature Review** 8. Incorporate a brief literature review summarizing prior studies on finned collectors and hybrid solar drying systems. **Methodology** 10. Provide a clearer explanation of the fin design and its unique characteristics compared to existing designs. 11. Elaborate on the numerical modeling technique, particularly the assumptions and boundary conditions. 12. Include details on the accuracy and calibration of the measurement instruments used in the experiments. 13. Explain why specific materials (e.g., glass, steel) were chosen for the solar collector components. 14. Ensure the figures (e.g., collector cross-section) are well-labeled and easy to interpret. **Results and Discussion** 15. Reorganize the results and discussion sections to avoid redundancy and improve coherence. 16. Discuss the discrepancies between theoretical and experimental results in more detail, including potential causes and implications. 17. Compare the efficiency of the proposed design to a broader range of existing collectors for a more comprehensive analysis. 18. Provide a clearer explanation of the factors contributing to the collector's efficiency (e.g., turbulence, surface area). 19. Include sensitivity analysis to demonstrate how variations in key parameters (e.g., fin design, flow rate) affect performance. **Figures and Tables** 20. Ensure all figures are of high quality, with clear legends, labels, and captions. 21. Add a flowchart summarizing the methodology for better visualization. 22. Ensure tables are self-explanatory and provide sufficient detail about the parameters and variables **References** 23. Update the reference list with more recent studies (2020–2024) related to solar air collectors, hybrid systems, and thermal efficiency improvements. 24. Ensure all references are cited consistently and formatted correctly according to the journal guidelines. 25. Include more journal references (e.g., from *Renewable Energy* or *Solar Energy*) for a stronger academic foundation **Language and Clarity** 26. Revise grammatical errors and improve sentence structure for better readability and scholarly tone. 27. Simplify complex sentences to make the manuscript more accessible to a broader audience. 28. Maintain consistent verb tenses throughout the manuscript, particularly in the methodology and results sections. **Conclusion and Implications** 29. Expand the conclusion to discuss the broader implications of the findings for solar energy and sustainability. 30. Provide suggestions for future work, such as exploring different fin designs, alternative materials, or hybrid applications in other climates.	

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:	**Mandar Sumant**
Department, University & Country	**Drs Kiran & Pallavi Patel Global University, India**