Review of: "Numerical Study of Thermal Performance on Fin and Tube Heat Exchanger with Flat Rectangular and Sinusoidal Winglet Vortex Generators"

Ahmed Ramadhan Al-Obaidi[1]

1 University of Mustansiriyah

Potential competing interests: No potential competing interests to declare.

Reviewer Comments

In this paper, generation of vortices in the fin and tube heat exchanger is one of the common methods to reduce the air-side thermal resistance. This study deals with the enhancement of heat transfer on the air side using conventional rectangular and sinusoidal sine wave vortex generators. The vortex generators are placed in the downstream location of the tube in the common flow-down configurations, and the range of Reynolds numbers is maintained at about 400 to 1100. The following should be carefully addressed in the revision to be published.

1. The novelty of the work must be clearly addressed and discussed, compare your research with existing research findings and highlight novelty, (compare your work with existing research findings and highlight novelty)
2. The authors should have followed the instructions of the journal for all parts and sections in this manuscript. Also, the similarity index must be reduced to not more than 20%, with not more than 3% from a single source. Please check the number of each section, equation, and chart.
3. Complete the mathematical calculation model with all nomenclature missing.
4. The abstract needs more quantitative results. The abstract section is an important and powerful representation of the research. It is better that the results should be presented with the support of specified data.
5. The main objective of the work must be written in a more clear and concise way at the end of the introduction section.
6. The introduction section must be written in a more quality way, i.e., more up-to-date references addressed. The research gap should be delivered in a more clear way with a directed necessity for the conducted research work.
7. The authors should indicate this technique to enhance system performance. Also, the authors should add more references that discuss the effect of using this technique. It is recommended that the authors carry out a wide analysis and comparison with state-of-the-art studies.
8. Most tables and figures need to improve the quality of all tables and figures.
9. Add references for all equations.
10. I would also expect to validate with two more experimental works available in the literature.
11. The literature review must be improved. Please highlight in the literature review the differences between previous papers and your paper. Please clearly indicate the knowledge gap and prove that it is a really not analyzed area of the field. Please indicate new approach / new methods in comparison to the existing investigations (literature review

should be extended by adding the below references). Influence of different geometrical dimple configurations on flow behaviour and thermal performance within a 3D circular pipe. Investigation and evaluation of thermo-hydraulic flow and heat improvement in a 3D circular corrugated pipe based on response surface method and Taguchi analyses. Flow field structure, characteristics of thermo-hydraulic and heat transfer performance analysis in a three-dimensional circular tube with different ball turbulators configurations. Investigation of thermal flow structure and performance heat transfer in three-dimensional circular pipe using twisted tape based on Taguchi method analysis. A numerical study to investigate the effect of turbulators on thermal flow and heat performance of a 3D pipe. Thermal flow and heat performance analyses in circular pipe using different twisted tape parameters based on design of experiments. The effect of different twisted tape inserts configurations on fluid flow characteristics, pressure drop, thermo-hydraulic performance, and heat transfer enhancement in the 3D circular tube. Characterization of internal thermohydraulic flow and heat transfer improvement in a three-dimensional circular corrugated tube surfaces based on numerical simulation and design of experiment. The influence of different twisted tape inserts configurations on thermo-hydraulic performance and enhancement of heat transfer in the 3D circular tube. Evaluation of thermal hydraulic flow and enhancement of heat performance in different 3D dimpled tube configurations according to design of experiment analysis.

12. Description of CFD analysis should be improved. More quantitative information about the grid selection (which method was used, how the mesh was created, how the inflation regions were chosen and designed, etc.), about the accuracy of turbulence models chosen for the given application, about the Y+ values and their meaning for the chosen model, etc.
13. You need to add an error analysis of your results and add the error bars in your graphs to indicate your accuracy measurements.
14. Improve work justification.
15. More quantitative conclusions should be presented. Please prepare additional comparisons, some percentage differences. There is a lack of quantitative conclusions which should contain main findings from the paper and highlight the new and high novelty and contribution of your work to the field.
16. Present the mathematical equations of the boundary conditions and initial condition.
17. I would also suggest including in the conclusion section, but also in several other places in the manuscript, discussion and comparison with findings from other authors with similar published research work.
18. It is recommendable to add the below references in order to underline the connections of the manuscript with the aims and scope of the Journal. A numerical study to investigate the effect of turbulators on thermal flow and heat performance of a 3D pipe. Investigation of Thermo-Hydraulics Flow and Augmentation of Heat Transfer in the Circular Pipe by Combined Using Corrugated Tube with Dimples and Fitted with Varying Tape Flow felid and heat transfer enhancement investigations by using a combination of corrugated tubes with a twisted tape within 3D circular tube based on different dimple configurations. Investigation of flow pattern, thermohydraulic performance, and heat transfer improvement in 3D corrugated circular pipe under varying structure configuration parameters with development different correlations. Investigation on effects of varying geometrical configurations on thermal hydraulics flow in a 3D corrugated pipe

19. The conclusion section lacks summative conclusions. The main results, novelty, and academic contributions should be emphasized in this section. Moreover, are the results obtained in this paper really applicable in other similar researches?
20. In the discussion development, it is very important to emphasize points of agreement or disagreement between results in this work and others cited in the references part of the manuscript.
21. Authors should discuss limitations of the current study and possible improvements for future directions/research works.
22. The nomenclature list is not complete. Please recheck parameters, variables, and abbreviations that appeared in the manuscript and append them to the nomenclature list. Authors are requested to check the reference format and correct some inconsistent formats.
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