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

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Potential competing interests: No potential competing interests to declare.

The manuscript has been prepared based on a numerical study only for fin and tube heat exchangers with various vortex generators. However, the objective of the present work with the said geometry and modelling for fin and tube heat exchangers is very appreciable. Nevertheless, the present study does not meet the requirements for the effectual cooling phenomenon for such types of heat exchangers. This study can be strengthened by adding some additional information and physical aspects. The present manuscript is **recommended for publication subject to the revision** of the manuscript as per the suggestions mentioned below.

Comment 1: In the abstract, the article reports that the Reynolds number varies between 400 and 1100. What is the basic reason to select this range of Reynolds number, 400 to 1100?

Comment 2: In the sixth line of the abstract, the word “variation” is repetitive; as a result, it is not pleasant to read this sentence. It should not be repeated for temperature, pressure, and friction factor.

Comment 3: This article does not mention either solution algorithms, schemes, or any simulation tool for the entire analysis in the “abstract” section. It is more important to portray the work in one paragraph.

Comment 3: In the “Introduction” section, authors wrote many times, “results revealed that,” almost for the entire literature review. Authors can either change the words or recreate the sentences in an attractive way so that the reader cannot be irritated to read the literature review.

Comment 4: At the end of the introduction section, especially in the objective section, there must be at least one or two sentences concerning the research gap of the present study followed by the objectives. Moreover, there should be a certain reason why authors are selecting the values and ranges of the specified parameters, such as Reynolds number, angle of attack, and aspect ratio.

Comment 5: Figure 1 shows six rows of tubes, but authors mentioned that there are seven rows of tubes in an in-line arrangement, which is correct for the remaining figures. Thus, it should be corrected in Figure 1.

Comment 6: Authors mentioned that the governing equations are in non-dimensional form. However, the reviewer does not observe any non-dimensional parameter such as the Reynolds Number, etc., in the governing equations, especially in

the momentum and energy equations. There is no source term regarding the thermal aspects in the momentum equation so that the computational domain can be affected by the heating section. There are no isotherm contour figures in the present article to better understand the heating and cooling zones in the entire domain. Only velocity and pressure distributions are not sufficient to exhibit the complete thermal and flow behaviour inside the computational domain.

In addition to the above comments, the reviewer needs a clear explanation of the mode of heat transfer, as it has not been mentioned in the entire manuscript. The Reynolds number is very low; then, why the need for a turbulence model? Justify it.

Comment 7: There must be a figure of the computation domain along with proper meshing and put in the separate section “grid-independence test.”

Comment 8: There is no formula for getting the Nusselt number and I/J factor (London area goodness factor) in the entire study. It should be mentioned in the article to justify the figures of Nusselt number and I/J factor variation with the Reynolds number.

Comment 9: In the section “results and discussion,” especially in 3.1 and 3.2, there is no distinct explanation for various geometries with appropriate physical aspects, so that one can recognize the explicit behavior of the various vortex generators.

Comment 10: The sizes of the computational domains in figures 4 and 5 are varying, which conveys that the authors are changing the aspect ratio as a varying parameter. It is contradictory to the authors' statement that the aspect ratio is 0.5.

Comment 11: Since the present article is only a numerical study and needs proper authentication, it should be validated with existing benchmark results similar to the geometry considered in this article.

Comment 12: There is a typo error, for example, the word “lass” in the line just above figure 7.

Comment 13: Please avoid writing the words in the past tense such as "was," "were," "had,” etc. It is very conventional to write the manuscript in the present tense along with the passive voice. Tense usage is not consistent. The simple past indefinite tense may be employed.

Comment 14: For the literature in the introduction section, please rewrite the sentences for literature 7, 8, 14, 19, 20, 21, 22 (first line incomplete), and overall, the reviewer suggests that you please read again carefully all the statements in the introduction section to remove all typos and grammatical errors. It will be more convenient to use Grammarly to correct the sentences.

Comment 15: Last but not least, what is the practical application of such a type of heat exchanger in our daily life and industrial aspects? This should be clearly added to the manuscript.