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

Nabil Bessanane[1]

1 Université de Batna

Potential competing interests: No potential competing interests to declare.

In my opinion, the paper needs to be carefully rewritten, paying more attention to the methodology of presenting the literature review, and also to the content of the paper (methods of problem formulation and discussion of results).

The general opinion on the subject is that the study needs major revision.

In the literature, there are many studies on this topic. It is recommended to give more arguments to the novelty of the study; its status can be determined precisely by making parametric comparisons to validate and justify the obtained results.

The idea of the paper "Adding vortex generators with different shapes" is very interesting. But this paper is not ready for submission in its actual version; there are some suggestions and remarks which can improve its quality:

1. May be rearrange the title
2. The abstract must include the numerical results (percentages) and should be rewritten to attract the reader's attention.
3. Give more information about your problem assumptions (2D or 3D), SteadyState or unsteady, dimension of the computational domain with vortex generators…etc.
4. In Fig. (1-C), can you explain what "**sinusoidal wavy rectangular winglet**" means?
5. The flow is at low Reynolds number, but you used the RNG-KE turbulence model. It's true! But you have to justify your choice as it's cited in various studies by different authors. These arguments are carefully detailed for this kind of complex geometries with small scales of fluid passage and fins (vortex generators) effects on both hydrodynamic and thermal fields.
6. The reference quantities are not well defined (T fluid, T wall, hydraulic diameter Dh, reference velocity (average or maximum) to calculate the Re number, friction factor, ...etc.).
7. Be sure to use the same legend scales in your comparisons to ensure perfect results. I think better post-processing can be used to get more visibility for your Ansys Fluent results.
8. In section 3, Fig. 7, it's presented i/j as the variation of the London area goodness factor vs Reynolds number, which is known as LAGF(j/f) in literature. So which one of is friction factor i or j? In addition, there is a contradiction in your arguments (section 3.4) between the discussions of Figures 7 and 6(b). You say that the sinusoidal form has less pressure penalty compared to the rectangular shape (Fig. 7), on the other hand, the pressure drop produced by the

wavy shape is the greatest according to Figure 6(b)!?

9. The conclusion needs to be rewritten more carefully to clearly reflect the results obtained and discussed in the content of section 3. For example, there is a paragraph that talks over the variation of the friction factor against Reynolds number and gives percentage values. However, no explanatory figure linked to these results has been introduced.