

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.

Summary:

The article investigates the use of rectangular and sinusoidal winglet vortex generators to improve heat transfer in fin-and-tube heat exchangers. The authors numerically analyze the heat transfer characteristics and quantify them using the Nusselt number. However, there are some concerns that require attention for the work to reach its full potential.

Strengths:

- The article explores an approach to improve heat transfer in fin-and-tube heat exchangers using vortex generators.

Areas for Improvement:

- **Governing Equations and Mathematical Formulation:** A complete description of the governing differential equations is missing. Additionally, equations 2 and 3 are incorrect mathematically as they are not tensor equations, and including their correct forms would be required. This would enhance the clarity and credibility of the work.
- **Turbulence Modeling:** The authors should provide justification for the chosen k-epsilon turbulence model because another model might be more appropriate. Addressing this point by incorporating turbulence equations, justifying the turbulence model selection, or exploring alternative models would strengthen the modeling approach.
- **Novelty and Impact:** The authors need to clarify the novelty of the work. How does this research differ from previous studies on heat transfer enhancement in fin-and-tube heat exchangers? Does it demonstrate a measurable improvement in heat transfer rates? Furthermore, outlining the potential applications and impact of this work would add great value to the research.
- **Call out Limitations & Future direction of work:** The authors are advised to include future directions for the work and call out the limitations of the current work, both of which would significantly improve the manuscript's quality.