Review of: "Numerical Simulation and Computational Fluid Dynamics Analysis of Two-Dimensional Lid-Driven Cavity Flow Within the Weapon Bay of an Autonomous Fighter Drone"

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Potential competing interests: No potential competing interests to declare.

1. In the abstract, the authors mentioned that our simulations encompass high Reynolds numbers, reaching up to 10,000; however, the maximum Reynolds number found was 1,000.
2. In the literature review section, the authors inadvertently referred to the content as being part of the present study, when in fact, it pertains to previous research. For instance, they stated, 'The purpose of the current work is to apply the multigrid approach to solve the Navier-Stokes equations for a jet aerodynamic problem, achieving solutions with high Reynolds numbers, high speeds, and mesh refinements.' Instead, this should be correctly framed as a review of relevant research. For example, 'In prior studies, researchers have applied the multigrid approach to solve the Navier-Stokes equations for various aerodynamic problems, achieving solutions with high Reynolds numbers, high speeds, and mesh refinements. An illustrative study involved a numerical simulation and computational fluid dynamics (CFD) analysis of three-dimensional lid-driven cavity flow within the weapon bay of an autonomous fighter drone.
3. In certain sections, the authors should denote the variables using subscripts or superscripts for clarity, specifically indicating 'i' and 'j'
4. The article references Figure 3, but it is not present in the manuscript.
5. Figures 3 and 4 seem to depict general working steps. It would be beneficial to present specific values or essential steps involved in the setup.
6. The numerical error is mentioned, but there are no calculations or values provided to instill confidence in the readers. It would be beneficial to improve by incorporating the calculations or displaying the values for the readers' assurance.
7. Please review and rearrange all the figures.
8. The authors stated, 'The other boundary conditions are shown in Fig. 1,' but this information is not found in Figure 1.
9. The authors stated, 'obtained from Eq. (19) for a given Re,' but this equation is not found in the article.
10. The references [20], [30], [23], [26], [35], [42]–[46] should be arranged in the correct order.
11. The authors stated, 'the contours of the vorticity in Fig 6 and Fig 7,' but these figures are not found in the article.
12. The authors mentioned, 'Figure 4 displays the velocity profiles in the two directions at the cavity center.' However, Figure 4 does not correspond to this description, and the text does not present the results of calibration or validation
13. Are there significant differences in the results for various Reynolds numbers?
14. In conclusions, the authors stated, ‘It was also noted that using a triangular mesh yielded slightly different results from

using a quad mesh, indicating the need for additional research into the influence of mesh types on simulation outcomes.' However, it's important to note that there was no specific study conducted on the use of a triangular mesh in this research. Therefore, it may not be appropriate to draw conclusions regarding its influence on simulation outcomes.

15. In the abstract, the authors state, 'Overall, our study highlights the significance of numerical simulations and CFD analysis in the design and optimization of autonomous fighter drones for military applications.' However, in the conclusion, they mention, 'objective of assessing the accuracy and efficacy of the analysis.' Nevertheless, a clear summary or presentation of this information is not evident. The provided content includes only mesh images and velocity plots from the simulations.
16. The study's significant results are relatively limited, spanning less than one page, despite the presentation of three to four pages of crucial equations. These equations could be highly beneficial for readers if the authors provided corresponding computational data or discussed the outcomes of these computations.
17. Presenting specific information related to the Weapon Bay of an Autonomous Fighter Drone would significantly enhance the paper's utility.