Review of: "Aerodynamic Design and Performance Analysis of Mars Ascent Vehicles"

Victoria Kurushina

Potential competing interests: No potential competing interests to declare.

The comments are as follows:

1. Please, include the mesh independence test results.
2. Please, specify solution settings, residuals, time step size, simulation time.
3. The title of the paper focuses on the ascent, however, the accent is on reentry in the abstract. This has to be consistent throughout the paper, because estimating the aerodynamics and heat transfer for ascent only, or for ascent and descent, or for reentry only has different priorities.
4. Please explain for the reader how the Martian atmosphere factors in the simulation. The paper mentions just “air” and dimensionless quantities, but this should be explained. Please add more information throughout the manuscript where relevant.
5. Please include a figure specifying the domain size, distance between the structure and the inlet/outlet/boundaries. Also, a general schematic of the physical system could be of benefit to this paper, such as object + acting forces.
6. Please expand the literature review to include more sources. There are not many CFD research papers cited in the current version, while aerodynamic analysis is an active field of research. Please revise the novelty claim according to what is already reported in the literature.
7. Please include more results for the variables of the flow field around the structure.
8. “Aircraft” is mostly used for within Earth's atmosphere; “spacecraft” is more appropriate if reentry is discussed.
9. Also, pre-processing, simulation, and post-processing are stages of the analysis, not methods of CFD, as mentioned in the paper.
10. Please name the software or the in-house code you are using.
11. Please include the nomenclature.
12. Please revise the first line of Methodology.