

I. IDENTIFICATION DATA

Thesis title:	Aerodynamics of Bodies at Very High Mach Numbers
Author's name:	Lee HyoungJu
Type of thesis :	bachelor
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Fluid Dynamics and Thermodynamics
Thesis reviewer:	doc. Ing. Tomáš Hyhlík, Ph.D.
Reviewer's department:	Department of Fluid Dynamics and Thermodynamics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	ordinarily challenging
<i>How demanding was the assigned project?</i>	
Please insert your comments here.	

Fulfilment of assignment	fulfilled
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
The author fulfilled all parts of the assignment at a sufficient level.	

Methodology	correct
<i>Comment on the correctness of the approach and/or the solution methods.</i>	
Through numerical simulations, the author solved the flow around the body at high Mach numbers.	

Technical level	B - very good.
<i>Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?</i>	
In my opinion, the mathematical model mentioned in the thesis is not suitable for certain boundary conditions used in numerical simulations. The author does not thoroughly demonstrate the limitations of the used model in relation to the results of numerical simulations.	

Formal and language level, scope of thesis	A - excellent.
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
Please insert your comments here.	

Selection of sources, citation correctness	C - good.
<i>Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?</i>	
In the work dealing with the numerical solution of the flow, the author does not reference works that address the numerical solution of similar problems.	

Additional commentary and evaluation (optional)
<i>Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.</i>
Please insert your comments here.



III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

Questions:

- 1) How is the emissivity of the gas incorporated into the radiation model that you used, and how are the walls of the body modeled in your simulation regarding radiation? Compare the results of the numerical simulation without the radiation model with the results where the radiation model is taken into account.
- 2) What are the values of total temperature and total pressure that you utilize in numerical simulations? How are they determined?
- 3) Which parameter do you use to identify shock waves in numerical simulations? Which parameter is used in experiments?
- 4) One of your images shows a temperature of 20,000 K. Do you believe this value falls within the range of your model?
- 5) What is the impact of the turbulence model that you employed? Compare the results of the numerical solution without the turbulence model to the results where it is utilized.

The grade that I award for the thesis is **B - very good**.

Date: **14.8.2023**

Signature: