1 Introduction

1.1 The problem of aerodynamic drag

Dlaczego badamy oraz wzór na opór aerodynamiczny. Że bazujemy na modern exterior balistics i jakieś inne z literatury bo to ładnie brzmi.

1.2 Methodology of the present work

For simulations, two programs were chosen to compare the results. The first program, Solidworks Flow Simulation, was used for both CFDs and model preparation. The second program utilized was Ansys Fluent.

Initially, the models were prepared in Solidworks and subsequently exported to .step (214) file format for importation into Ansys. Within Ansys, Fluent with Meshing was used to prepare the mesh, followed by the execution of simulations. Solidworks Flow Simulation was also employed for mesh preparation and simulation execution, enabling subsequent comparison with results obtained from Ansys Fluent.

Parametric studies/sets were conducted for all models, encompassing nine different velocities ranging from 0.1 to 1.0. Subsequently, resulting graphs depicting the drag coefficient versus Mach number were analyzed and compared.

1.3 Tested models

R6-Endcone, R6-No-Endcone, PrawieR5

For each set of simulations, computational domain mesh setting and graph of velocity and pressure for 0.6 mach will be shown.

2 Initial study

Work was started with the remodeled R5 model. The model was prepared in Solidworks and had endcone, which was the change compared to the original R5 model. The model was tested in Solidworks Flow Simulation. The results can be seen here:

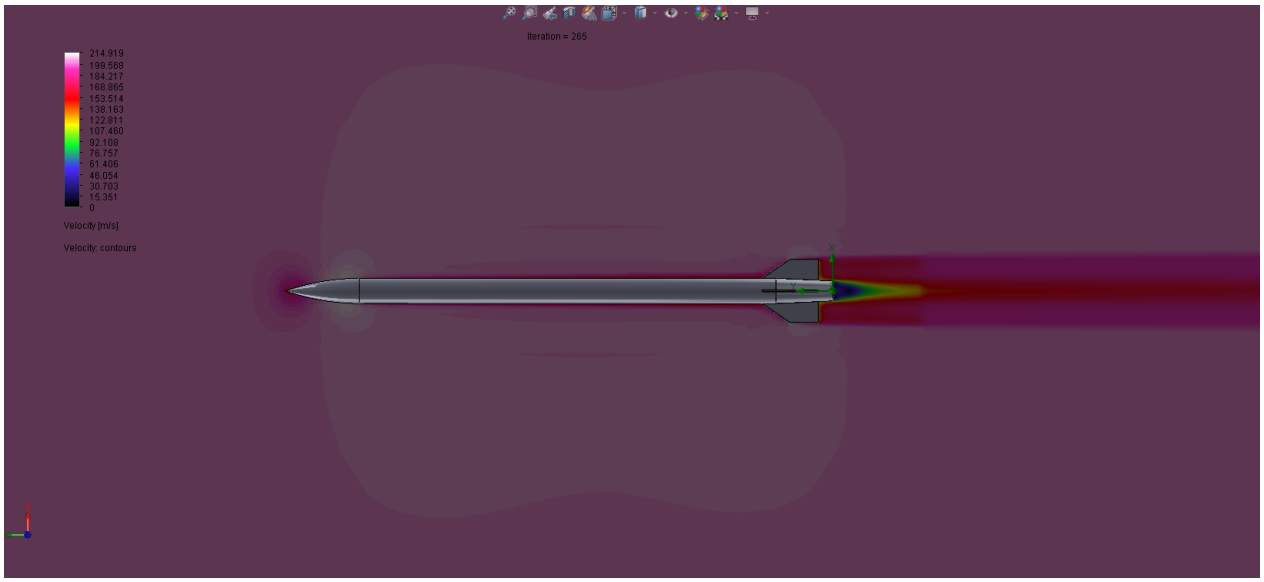

Figure 1: Velocity graph for PrawieR5 model at Mach 0.6

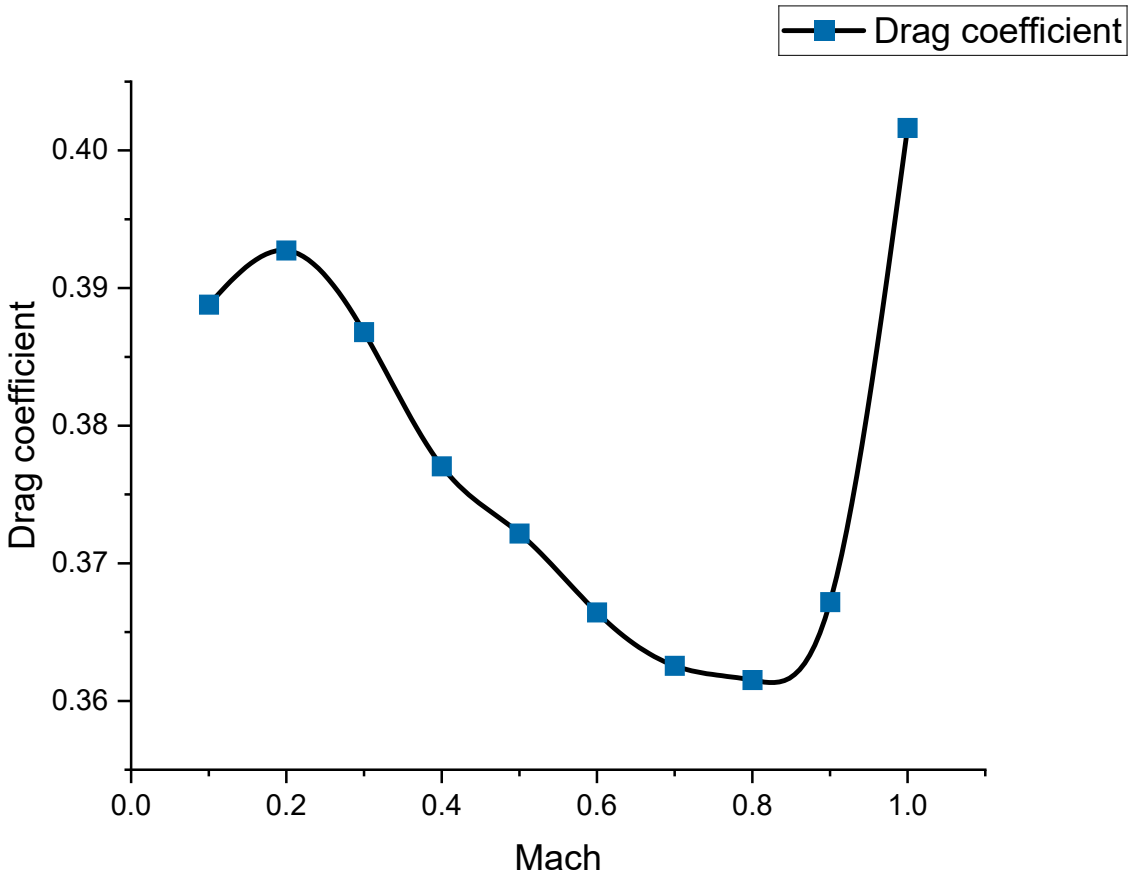

Figure 2: CD graph for PrawieR5 model at Mach 0.6

This model was only used to compare the results of older model with the new one.

3 R6 Endcone

3.1 Solidworks

- Domena i mesh
- Kolorki dla 0.2, 0.5, 0.8

3.2 Ansys Fluent with meshing

- Domena i mesh
- Kolorki dla 0.2, 0.5, 0.8

Wykresy obu na koniec zestawić.

4 R6 No Endcone

4.1 Solidworks

- Domena i mesh
- Kolorki dla 0.2, 0.5, 0.8

4.2 Ansys Fluent with meshing

- Domena i mesh
- Kolorki dla 0.2, 0.5, 0.8

Wykresy zestawić.

5 Results and discussion

- Wykresy CD solida
- Wykres CD fluenta
- porównanie CD dla wyników solida i ansysa jakąś tam statystyką z użyciem pythona(ja to zrobie)
- Podsumowanie że wyszedł lepszy dla endcone(co się zgadza z literaturą i przewidywaniami) oraz jakieś tam gadu gadu o Solidzie że gorszy.