ABSTRACT

Aerodynamic devices are used in higher level of automobile motor sports such as Formula One to increase the traction between the tires and road surface by generating down force. This allows the racers to perform well in corners with high speeds without losing the control of the vehicle. To incorporate these devices to race cars it is very crucial to understand the behavior of air flow around vehicles.

The aim of this thesis is to design a front wing and analyze it for its performances to the team 'e wolfs' electric car. Understanding of aerodynamics theories and following them for designing according to Society of Automotive Engineers Formula Student (SAEFS) rules and regulations is carried out throughout the project. The designing is done using computer aided designing (CAD) software SOLIDWORKS and analysis is done using computational fluid dynamics (CFD) of SOLIDWORKS FLOW SIMULATION.

The front wing is one of the main crucial devices due to its influence on the handling and dynamics of the car and efficiently guiding the air flow to the other parts of the car. Design used for the front wing is based on (Airfoiltools S1223 (S1223-Il), 2016), researches published in many journals, articles, project thesis. Three model designs were tested for their optimum performances and compared to theoretical values that are calculated.

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