




Individual Project Meeting Record

Project Title	Design and manufacture of an aerodynamic undertray for Formula Student		
Supervisor	Dr. Rob Watson	Student	Dennise Zefanya Tohpati
Date and time	MEETING 10 – 4th December 2020	Location	MS TEAM [ONLINE]
<p><u>Review of actions from previous meeting</u></p> <ul style="list-style-type: none">Analysed 3D open flow of bluff body with skirt using number of inlet and outlet angle variables from 2D to validate the flow behaviour in respect of its negative lift and drag.Plot the X-wall shear on 3D open-flow analyses to see the separation of the flow on the undertray.Initial flexible 3D design with assumed inlet and outlet angle of the undertray has been designed. <p><u>Discussion, decisions, assignments</u></p> <ul style="list-style-type: none">3D open-flow analyses with outlet angle of 15 and 20 degrees has been analyse and compared to the 2D open-flow lift and drag trend.It is found that the lift and drag trend of 2D and 3D open-flow analysis results are significantly contrary. It was suspected that the vortices formed on the diffuser has something to do with the sticking fluid at the diffuser wall which create lower drag and higher downforce.The wall shear of the diffuser wall on 3D analyses also indicated no negative value which means there is no separation on the diffuser wall.Discussed the initial 3D design of the undertray. The design was made using the chassis node which means it may needs some adjustment to be fitted to the race car. It was suggested that additional vortex rear diffuser may reduce the overall drag as suggested from previous paper.Discussed on how the flow under side-diffuser could be affected due to chaos flow caused by the front wheels. Diversion of side diffuser was suggested to get cleaner flow for another prototype but further CFD analyses on this case are required <p><u>Agreed actions and completion dates</u></p> <ul style="list-style-type: none">Take a step back and analyse the 2D-open flow with exact 3D cross-section dimension to see the flow behaviour from the top and bottom part of the bluff body.Continue designing the 3D prototype design of the race car undertray with suggested changes on the vortex diffuser and diversion of side diffuser.			
Date and time of next meeting	Friday 11 th December 2020	Location of next meeting	MS TEAM [ONLINE]
Supervisor signature		Student signature	Dennise Tohpati