

Abstract Details

Title: Efficiency Enhancement of Racing Cars Using Aerofoil

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Abstract: In design of a racing car inside a given class, a number of parameters such as vehicle weight, engine power, and aerodynamics shape have to be optimized in context to attain highest performance. Aerodynamics is the most important out of these parameters. The test matrix was chosen to cover the effects of changing major variables of flap plane form, endplate plane form, angle of attack, flap deflection, and Reynolds number at a ground clearance of 9.906 cm (0.3). Low-Speed Wind Tunnel to quantify the performance and flow field effects of two-element open-wheel-race-car front wing configurations. Four distinct configurations were tested in- and out-of-ground effect and at various speeds (Reynolds numbers), angles of attack, and flap positions. From parametric CFD simulations on F-1 car attached with add-on devices, there is a considerable amount of drag and lift force reduction besides streamlining the airflow across the car. The best possible configuration for all add-on devices, i.e. front and rear wings, nose wing, barge board, roof spoiler and wheel scallops, are derived from CFD simulations. The combination of all these add-on devices with the most appropriate configurations is suggested to incorporate for F1 race car to improve aerodynamic performance.

Keywords: Efficiency, Racing Cars, Aerofoil.