

An Investigation into the Use of Overset Mesh for a Vehicle Aerodynamics Case When Driving in Close Proximity

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Abstract : In recent times, the drive towards more efficient vehicles and the increase in the number of vehicle on the roads has driven the aerodynamic researchers from studying the vehicle in isolation towards understanding the benefits of vehicle platooning. Vehicle platooning is defined as a series of vehicles traveling in close proximity. Due to the limitations in size and load measurement capabilities for the wind tunnels facilities, it is very difficult to perform this investigation experimentally. In this paper, the use of chimera or overset meshing technique is used within the STARCCM+ software to model the flow surrounding two identical vehicle models travelling in close proximity and also during an overtaking maneuver. The results are compared with data obtained from a polyhedral mesh and identical physics conditions. The benefits in terms of computational time and resources and the accuracy of the overset mesh approach are investigated.

Keywords : chimera mesh, computational accuracy, overset mesh, platooning vehicles

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