# Impact of the Truck Wave Region to the Aerodynamics of Saloon Car

**Dani Harmanto**
Research for Advanced Design and Simulation
University of Derby
Derby, DE22 3AW, United Kingdom
d.harmanto@derby.ac.uk

## Abstract

A wake region will be produced by truck when it is travelling at their maximum allowance speed which is 56 miles per hour. The wake region can be seen clearly when a truck travelling at a wet road. The wake region has its own force which will affecting any vehicle travelling behind or next to the truck. This paper presents a numerical study of the flow field in the aerodynamics of the saloon effecting by the wake region. Simulation will be carried out for different position of the saloon next to the truck. The numerical study will be validated using Ahmed body to determine the mesh and domain size. The velocity will be set at 56 miles per hour and assuming the truck will be travelling alongside the motorway. The rotating region will be used for truck and saloon and the angular velocity will be calculated based on the circumference of its tires. Detailed analysis and result such as CD and CL together with the x-y chart will be presented to provide a better understanding of the effect of truck wake region to the saloon when it is behind or next to the truck.

## Keywords
Aerodynamics, Truck, CFD, Saloon car, overtaking

## Biographies

Dr. Dani Harmanto is currently the acting programme leader (course director) of BEng (Hons) Motorsport Engineering and senior lecturer in automotive Engineering at University of Derby. He had secured number of funding from UK and Local government for knowledge transfer partnership for developing a novel product. He obtained his mechanical engineering degree from ITN Malang, Indonesia. His MSc and PhD in Automotive Engineering from Coventry University, United Kingdom. He is also a Chartered Engineer (CEng). He is sitting in the committee of Education and Training at Institution of Engineering Designer (IED), United Kingdom as a member. He is also a member of the Automobile division at the Institution of Mechanical Engineering (IMechE), United Kingdom. In addition to this, he is a Fellow Member of Higher Education (FHEA) in the UK. He is mainly teaching at undergraduate and master level (Thermofluids, CFD, FEA and Design). His main research interests include computational fluid dynamics, finite element analysis, and renewable energy. His current research concerns the reduction of the jet noise using Computational Fluid Dynamics with one of the world announce jet engine manufacturer. He is a member of reviewers for Proceeding of Institution Mechanical Engineering part A – Z and several other journal publications.