Predicting the effectiveness of the aerodynamic drag reduction devices on the underbody of vehicle using Building Cube Method

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Objectives

To cope with the problem of global warming, it is required that CO₂ emissions from the vehicle be reduced. Aerodynamic drag reduction of the vehicle is an important subject to reduce CO₂ emissions, and effective aerodynamic development using CFD is demanded. High accuracy CFD requires fine grid, and the finer grid we take, the harder pre-processing we need. In this study, it is intended to get the prospects for the practical use in the aerodynamic development.

Outline of Results

3,200 million grids were calculated by CUBE with adopted BCM method. Even if calculation model was a complicated shape such as the motor vehicle, it was confirmed that it could be easily carried out from grid generation to run. Although using unstructured grid is main-stream in the industrial CFD, the finer grid we take, the harder pre-processing we need. The BCM method is able to make a large scale calculation practically, and it is possible to say that this method to obtain quick solution in the Large-scale CFD is promising in the future. Because solution time is insufficient as for the accuracy of validation, an additional calculation is required.