CFD for Vehicle Development in Nissan and Expectation to OpenFOAM

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Recently, vehicle development engineers have to study and answer higher requirements, for example, fuel and electric power consumption and the efficiency, new regulations for emission, etc. On the other hand, the phenomena should be solved in the vehicle development are becoming complicated one after another, such as multi-physics problems, trade off problems between some performances. Aero-thermal performance field is also same situation.

Depends on the above background, CFD tool supporting performance design and digital development process has been also required higher calculation accuracy and speed, and the application field has been expanding.

In this presentation, I'll introduce followings:

First: Nissan vehicle development process with digital phase called V3P and the execution organization for digital evaluation.

Second: CFD application timing, the fields of phenomena and then some examples such as Aerodynamic optimization, Thermal comfort in cabin, Vehicle stability with aero, etc.

Third: Current issues, such as evaluation accuracy & speed improvement and also the huge investment expense.

Fourth: OpenFOAM trial results as one possibility of the solution.

Then finally I'd like to mention the expectation to OpenFOAM such as innovation with AI / Data science by reasonable price.