

A comprehensive analysis of fluid dynamic applications for motorcycles

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In the development of motorcycles, CFD simulations are delivering continuous solutions for external aerodynamics, thermal analysis for radiators and riding comfort. The driving environment of a rider on a motorcycle is very different from passenger environment in a car. The riding comfort includes experiencing pressure forces, steering characteristics, acoustic noises and overheating, thus the air flow paths in motorcycle must be delicately designed with a balance to improve the overall performance of motorcycles. Wind tunnel data is used for validation and further optimization, counting in enhancing the stability and aerodynamic performance of motorcycles and many other individual components. Additionally, the efficiency of cooling system strongly depends on components near the radiator. A clear understanding of the flow pattern inside the radiator channel is essential for optimizing flow through the radiator core, thereby increasing the thermal efficiency by optimal fan positioning using MRF.

The open-source code and easy customization workflow is beneficial for achieving quick results with a high level of quality. There is a high potential in transferring standardized simulations from commercial software to OpenFOAM with the further enhancements in future versions.

