

流体力学の適用可能性を追求しよう！



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## Elucidation of flows about subsonic/supersonic vehicles and organism

Keyword: Road vehicle, Supersonic parachute, Respiratory flows, High-accuracy numerical methods

流体力学は、様々な研究分野や産業分野に適用されその範囲は拡大しつつあります。日常的な事項では、車両が引き起こす特徴的な流れを制御し、抵抗低減や騒音低減を実現することは、環境問題に直結する重要な課題です。未来志向の技術としては、惑星探査機の大気圏再突入時の減速装置たる超音速パラシュートの振動制御は、衝撃波、音波、渦の干渉を扱う流体力学的に奥深い問題です。また生体内の流れ現象を解明することは、医学のみならず工学にも有益な知見が返ってきます。これらを数値計算と実験により解明しています。

代表的なテーマは以下の通りです。

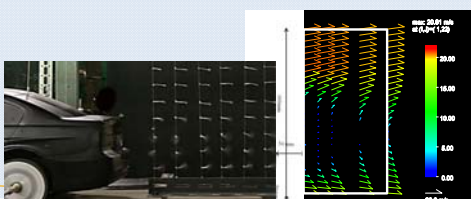
- 1) 車両等の空力特性の向上：空気抵抗低減
- 2) 超音速パラシュートまわりの流れ現象の解明と振動制御
- 3) 生体流れ：呼吸気流の解明と各部役割解明

Nowadays fluid dynamics is applied to various research and industrial fields, extending the covered fields. As daily items it is an important subject directly connected with environmental problems to reduce drag and noise through control of characteristic flows generated by road vehicles. As future-oriented technology, oscillation control for supersonic parachutes of planetary explorers at re-entry into the atmosphere is the profound subject which treats interference among shock waves, sound waves and vortices. On the other hand, elucidation of flow phenomena within organism leads to knowledge not only in the medical fields but also in the engineering fields. The above matters are solved by numerical and experimental simulations.

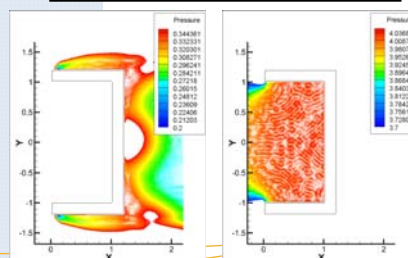
The typical research themes are given as:

- 1) Improvements of aerodynamic characteristics about road vehicles: reduction of drag
- 2) Elucidation of flow phenomena about supersonic parachute and control of oscillation
- 3) Organismic flows: elucidation of functions of each part in respiratory organ

1) Flows about road vehicle



2) Flows about supersonic parachute



3) Respiratory flows within nasal cavity

