



aerospace



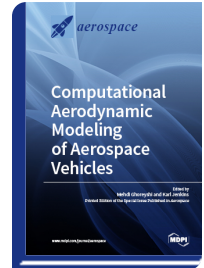
Special Issue Reprint

Computational Aerodynamic Modeling of Aerospace Vehicles

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Edited by
Mehdi Ghoreyshi
Karl Jenkins

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Currently, the use of computational fluid dynamics (CFD) solutions is considered as the state-of-the-art in the modeling of unsteady nonlinear flow physics and offers an early and improved understanding of air vehicle aerodynamics and stability and control characteristics. This Special Issue covers recent computational efforts on simulation of aerospace vehicles including fighter aircraft, rotorcraft, propeller driven vehicles, unmanned vehicle, projectiles, and air drop configurations. The complex flow physics of these configurations pose significant challenges in CFD modeling. Some of these challenges include prediction of vortical flows and shock waves, rapid maneuvering aircraft with fast moving control surfaces, and interactions between propellers and wing, fluid and structure, boundary layer and shock waves.

Additional topic of interest in this Special Issue is the use of CFD tools in aircraft design and flight mechanics. The problem with these applications is the computational cost involved, particularly if this is viewed as a brute-force calculation of vehicle's aerodynamics through its flight envelope. To make progress in routinely using of CFD in aircraft design, methods based on sampling, model updating and system identification should be considered.



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