Innovative numerical methods and simulation codes for compressible flows

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ABSTRACT

This mini-symposium (MS) aims at gathering researchers working on numerical methods for the simulation of compressible flows dedicated to aerodynamics.
We aim at pushing forward the state-of-the-art of highly accurate, robust and efficient simulation schemes focusing on flow problems involving shocks and large jumps around possibly complex objects.

The increasingly complexity of the models and genuinely 3D flying objects require that the numerical scheme implemented as the "engine" in a CFD code be provably robust and free from spurious behaviors (carbuncle instability, mesh imprint, wall heating, etc.). The meshing of such complex objects implies that trully unstructured grid is imposed.
Moreover the extension to high accuracy of the numerical scheme is a necessity to avoid dealing with too large a mesh. Ideally this extension (space/time) should also maintain the appreciable properties of the first order scheme.
At last such numerical schemes must be efficiently implemented in a parallel environement in an efficient fashion to use the HPC capability of the available computers.

The MS will accept presentations of innovative numerical methods which may improve one of the former difficulties or present new analysis.

The key words of this MS are to be found within the following non-exclusive and non-exhaustive list:
Eulerian hydrodynamics, Finite Volume method, Arbitrary Lagrangian Eulerian (ALE) methods, Advanced discretization methods, High-order nonlinear methods, unstructured grid, supersonic and hypersonic flows, aerodynamics...