A pressure-correction algorithm for all Mach number flows

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In this talk we will start by presenting an asymptotic analysis of the Euler/Navier-Stokes equations, in order to put in evidence the typical behaviour of the flow as the Mach number goes to zero. A pressure-correction algorithm for compressible fluid flow, developed in a co-located finite volume space discretization, is applied to simulate flows at all levels of Mach number. A new flux scheme, named Momentum Interpolation with Advection Upstream splitting based on a correct Mach number scaling to recover hydrodynamic and acoustic low Mach number limits will be presented. The capability of the proposed approach will be illustrated for different flow configurations.

Key-words: Co-located finite volume, momentum interpolation, pressure-based methods, all Mach number scheme.

References

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