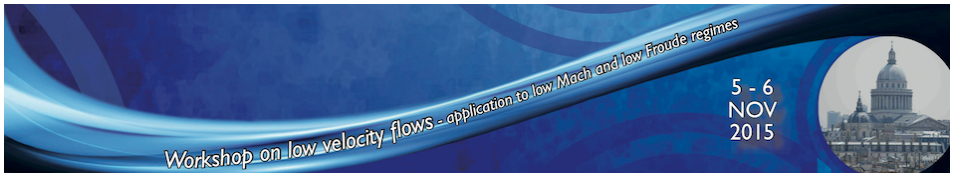

ID de Contribution: **6** Type: **Non spécifié**

An Asymptotic Preserving scheme in the low-Mach number limit for the Euler system

jeudi 5 novembre 2015 16:00 (45 minutes)

I am interested in the so-called Asymptotic preserving schemes. These schemes are well known to be well adapted for the resolution of multiscale problems in which several regimes are present. I will present the particular case of the low Mach number limit for the Euler system. We recall that when the Mach number tends to zero, the pressure waves are very fast and this yields the fluid incompressible. When a standard explicit finite volume scheme is used, it is well known that its time step is constrained by the C.F.L. (Courant-Friedrichs, Levy) condition. In the low Mach number regime, this leads to time steps invertely proportional to the very large pressure waves velocity. Thus, explicit schemes suffer from a severe numerical constraint in low-Mach regimes. Furthermore, these schemes are not consistent in this regime. This means that they do not capture the incompressible limit even if they are used with constrained meshes. Then, it is necessary to develop new schemes for bypassing these limitations. These new schemes must be stable and consistent in all regimes: from low Mach numbers to order one Mach numbers.

I will show how to construct such a scheme for the Euler system and I will present numerical results showing the good behavior of these schemes in all regimes.

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