



POSTDOC POSITION (2020)

Immersed Boundary Methods for high fidelity simulation of compressible flows

A 12-months post-doctoral position is opened in Institut PPRIME, starting in the beginning of 2020.

Keywords : Direct Numerical Simulation, Compressible flows, Turbulence, Immersed Boundary Methods, Aero-acoustics, High Performance Computing (HPC)

The project consists in the development and the numerical implementation of suitable immersed boundary methods for computational aeroacoustics, to allow accurate simulations of both the flow and the sound it produces (or that propagates in it). Immersed boundary methods are a set of methods that allow accounting for moderately complex geometries on Cartesian grids. High ordered yet robust (stable) boundary schemes should be developed for aeroacoustics. Targeted applications are wall bounded turbulent flows with series of cavities (such as perforate acoustic liners which are an important technology to absorb sound in ducts such as turbofan engines or to suppress combustion instabilities). The present study will be carried out using our in-house code compact3d [2-3], devoted to a direct computation of sound by Direct Numerical Simulation or implicit Large Eddy Simulation (DNS/LES). A great attention in the code development is paid to the computational efficiency, in the context of high performance computing (HPC). The postdoctorate fellow will have access to the local and French national supercomputers (GENCI).

References : [1] Laizet S, Li N, Int. J. Num. Meth. Fluids, 2011, 67, 1735–1757, [2] Sebastian R, Marx D, Fortuné V., Lamballais E., AIAA Paper 2017-4034, 23rd AIAA/CEAS Aeroacoustics conference, Denver, USA, June 5-9, 2017, [3] Marx D, Sebastian R, Fortuné V., AIAA Paper 2019-4034, 25th AIAA/CEAS Aeroacoustics conference, Delft, the Netherlands, May 20-24, 2019, [4] Sebastian R, Marx D, Fortuné V., J. Sound Vib., 2019, 456, 306-330, [5] Gautier R., Laizet S., Lamballais E., Int. J. Comput. Fluid. Dyn., 2014, 28(6-10), 393-410.

Administrative details

The postdoctoral fellowship has a duration of one year, with net salary ~ 2200€/month. The position is funded by the 2015-2020 CPER-FEDER program and is **available immediately**.

Location: Pprime Institute, 2AT Team (Acoustics Aerodynamics Turbulence), Poitiers, France.

<http://www.pprime.fr/>

<https://www.pprime.fr/?q=fr/recherche-scientifique/d2>

Profile

The applicant should have a PhD in computational fluid mechanics, aeroacoustics, or numerical methods. He/she should be highly motivated, have excellent technical skills, and good oral and written skills (either in French or English).

Contact

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