
Simon Mendez
Postdoctoral fellow in Fluid Dynamics
CTR, Stanford University. USA

Research interests

- Computational Fluid Dynamics
- Direct and Large-Eddy Simulations
- Aeroacoustics
- Near-wall modeling
- Thermal analysis

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26 years old

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PROFESSIONAL BACKGROUND

- 2008** **Postdoctoral fellow at Stanford University in the Center for Turbulence Research.**
Advisors. Prof. Parviz Moin and Prof. Sanjiva Lele, Stanford University.
– *Large-Eddy Simulations of supersonic jet noise*
- 2007-2008** **Postdoctoral fellow at CERFACS in CFD-Combustion group.**
Advisors. Prof. Franck Nicoud, University Montpellier II and Thierry Poinsot, Research Director at CNRS, IMFT Toulouse
– *Development and implementation of complex boundary conditions for multi-perforated plates in the CERFACS code, AVBP*
Implementation of an internal boundary condition reproducing a multi-perforated plate and coupling both sides independently of the grid
– *Numerical investigation of the acoustic behavior of a perforated plate*
Simulations of the behavior of the flow through a perforated plate submitted to an acoustic perturbation. Study of the relation between the flow and the acoustic response
- 2008** Teaching in aerodynamics for Undergraduate students for Masters Degree in Aeronautical Engineering. ENSICA Toulouse (France).
- 2004-2007** **Ph.D. at CERFACS (preceded by a 7-month training period)**
Advisor: Prof. Franck Nicoud, University Montpellier II
Ph.D. funded by the European project INTELLECT-DM (contract of the FP6)
– *Numerical simulation and modeling of the flow around multi-perforated plates*
Design of a new academic periodic configuration for simulations of full-coverage film cooling (film cooling through a multi-perforated plate) in order to :
 - Perform wall-resolved Large-Eddy Simulations of the flow around a perforated plate with and without cooling,
 - Develop, implement and validate a homogeneous model to account for full-coverage film cooling in numerical simulations where the effusion jets are not resolved.
- 2006** **Selection for the CTR Stanford University Summer Program 2006**
Collaboration with J. D. Eldredge, Assistant Professor at University of California, Los Angeles (USA) and G. Iaccarino, Professor at Stanford University (USA)

- *Numerical investigation and preliminary modeling of a turbulent flow over a multi-perforated plate*
 - Influence of numerical parameters on the results of periodic numerical simulations of the flow around perforated plates.
 - Comparisons between the CERFACS and the CTR LES codes (AVBP and CDP) in collaboration with M. Shoeybi, Ph.D. student at CTR.

- 2003** **Research training (2 months) at Institut de Mécanique des Fluides de Toulouse**
 Advisors: Jacques Magnaudet, Research Director at CNRS and Prof. Dominique Legendre, IMFT Toulouse
Numerical simulations of the two-phase flow filling of a water tank
 Two-phase flow simulations with the IMFT code JADIM using a Volume Of Fluid approach. Study of the mechanisms leading to bubble formation during the initial phase of the filling.
- 2002** **Technical training (1 month) in Spain**
 Assistance to the engineers in a steel factory
- 2001-2003** Personal teacher in Mathematics (Undergraduate students in Economy)

EDUCATION

- 2004-2007** **Ph.D. in Applied Mathematics**
University Montpellier II (France)
- 2003-2004** **Masters of Science in Fluid Dynamics**
Institut National Polytechnique de Toulouse (France)
- 2001-2004** **Masters Degree in Engineering: Fluid Mechanics and Energetics**
Ecole Nationale Supérieure d'Electrotechnique, d'Electronique, d'Informatique, d'Hydraulique et des Télécommunications (ENSEEIH) de Toulouse (France).

LANGUAGES AND COMPUTER SKILLS

- Languages** *French: Native*
English: Fluent (TOEIC 895/990 points)
Spanish: Fluent, family in Spain.
- Computer** *Programming: FORTRAN 90, MPI, C++, Matlab, Maple*
Numerical simulation: AVBP (CERFACS code), JADIM (IMFT code) Fluent
Software: TECPLOT, ENSIGHT, Fieldview, Igor, ICEM-CFD,
CENTAUR-SOFT, CFD-GEOM, Gridgen
System: UNIX, Linux, Windows, MAC OS X

ACTIVITIES AND INTERESTS

- Reading
 Cinema
2003- Running
2001-2002 **Member of an association for teaching in prisons**
1998-2001 Chess player in club
1997-2000 Table tennis

PUBLICATIONS

Papers in refereed journals

Mendez, S. & Eldredge J. D., 2009. Acoustic modeling of perforated plates with bias flow for Large-Eddy Simulations, *submitted to Journal of Computational Physics*.

Mendez, S. & Nicoud F. Adiabatic homogeneous model for flow around a multi-perforated plate, *AIAA Journal*, Vol. **46(10)**, pages 2623-2633.

Senoner, J.-M., Garcia, M., **Mendez, S.**, Staffelbach, G., Vermorel, O. & Poinso, T., 2008. Growth of rounding errors and repetitivity of Large-Eddy Simulations, *AIAA Journal*, Vol. **46(7)**, pages 1773-1781.

Mendez, S. & Nicoud F., 2008. Large-eddy simulation of a bi-periodic turbulent flow with effusion, *Journal of Fluid Mechanics*, Vol. **598**, pages 27-65.

Papers published in refereed conference proceedings

Mendez, S., Nicoud, F. & Poinso, T., 2006. Large-eddy simulations of a turbulent flow around a multi-perforated plate. In *Complex effects in LES*, Vol. **56**, pages 289–303. Conference *CY-LES 2005, Limassol, CYPRUS*.

Mendez, S., Nicoud, F. & Miron, P., 2005. Direct and large-eddy simulations of a turbulent flow with effusion. In *ERCOTAC WORKSHOP. Direct and Large-Eddy Simulations 6. Poitiers France*, pages 415-422.

Papers presented at technical meetings with reviews

Dassé, J., **Mendez, S.** & Nicoud, F., 2008. Large-Eddy Simulation of the Acoustic Response of a Perforated Plate, *14th AIAA/CEAS Aeroacoustics Conference, 5-7 May 2008 Vancouver, British Columbia, CANADA*. AIAA-Paper 2008-3007.

Mendez, S. & Nicoud, F., 2007. Numerical investigation of an anisothermal turbulent flow with effusion. In *5th Symposium on Turbulent and Shear Flow Phenomena. Munich, GERMANY*, Vol. **2**, pages 791–796.

Papers published in journals without referees

Duchaine, F., **Mendez, S.**, Nicoud, F., Corpron, A., Moureau, V. and Poinso, T., 2008. Coupling heat transfer solvers and large eddy simulations for combustion applications. In *Proceedings of the CTR Summer Program 2008, NASA Ames - Stanford University*.

Mendez, S., Eldredge, J. D., Nicoud, F., Poinso, T., Shoeybi, M. & Iaccarino, G., 2006. Numerical investigation and preliminary modeling of a turbulent flow over a multi-perforated plate. In *Proceedings of the CTR Summer Program 2006, NASA Ames - Stanford University*, pages 57-72.

Papers presented at meetings without reviews

Gullaude, E., **Mendez, S.**, Sensiau, C., Nicoud, F., and Poinso, T., 2008. Effect of multiperforated plates on the acoustics of combustion chambers. In *2nd Workwhop INCA, CORIA, Rouen, France, 2008*.

Duchaine, F., **Mendez, S.**, Nicoud, F., Corpron, A., Moureau, V. and Poinso, T., 2008. Conjugate heat transfer with large eddy simulation. Application to gas turbine components. In *2nd Workwhop INCA, CORIA, Rouen, France, 2008*.

Mendez, S. & Nicoud, F., 2005. Large-eddy simulations of a periodic turbulent flow over a perforated plate. In *1st Workwhop INCA*, pages 313-320, SNECMA, Villaroche, France, 2005.

Presentations at conferences/workshops without proceedings

Mendez, S. & Nicoud, F., 2008. Wall-modeling of perforated plates from large-eddy simulations analysis. LES in Science and Technology Workshop. 21-22 April 2008, Poznan University of Technology, POLAND.

Miron, P., and **Mendez, S.**, Nicoud, F. & Bérat, C., 2005. Comparison between LDA measurements and LES predictions of cold airflows through a multi-perforated plate. *Eurotherm Conference 82 NHT 2005 Gliwice-Cracow, POLAND*.

Artal, L., **Mendez, S.** & Nicoud, F., 2005. Using direct numerical simulations to develop wall functions. Minisymposium on Multiscale Methods in CFD. *ENUMATH Conference 2005, Santiago de Compostela, SPAIN.*