SHORT CURRICULUM VITAE Prof. A. L. De Bortoli

EDUCATION

Post doctoral in combustion, ITV - Institute fur Technische Verbrennung, RWTH-Aachen, Germany, 2007.

Ph.D. Thesis in aeroelasticity, UFSC (Federal University of Santa Catarina)-DLR (Deutches Luft und Raumfahrt - Braunschweig), Development and extension of an aerodynamic method for aeroelasticity, Germany, 1995.

Master degree in aerodynamics by the Federal University of Santa Catarina - UFSC, 1990.

Mechanical Engineer by the Federal University of Rio Grande do Sul - UFRGS, 1987

AFFILIATION

UFRGS - Federal University of Rio Grande do Sul (since 1996), Department of Pure and Applied Mathematics, Brazil Tel.: +55 51 3308 6189 (7087); FAX: +55 51 3308 7301 E-mail: dbortoli@pq.cnpq.br, dbortoli@mat.ufrgs.br;

Web: www.mat.ufrgs.br/~dbortoli

PROFESSIONAL EXPERIENCE AND PRESENT APPOINTMENTS

1993-1994: PhD student at DLR – Deutsches Luft und Raumfahrt, Braunschweig, Solution of incompressible flows based on compressible flow solvers, (UFSC-CAPES grant)

Leader of the GMS-RFD (Modeling and Simulation of Reactive Fluid Dynamics) group at UFRGS since 2004.

2006-2007: Post doctoral fellow in combustion, *Simulation of nonpremixed combustion inside a burner using flamelet models*, ITV – Institute fur Technische Verbrennung, RWTH-Aachen.

Board member of the Science and Technology Park - UFRGS, 2012.

Consultant for Petrobras - Brazilian oil company, since 2012.

Professor of mathematics and chemical engineering graduate programs

Lecturer of

Numerical Methods for Differential Equations Fluid Mechanics Computational Fluid Dynamics Introduction to Combustion Numerical Methods in Reactive Flows Special Topics in Fluid Dynamics: Non-Newtonian Flows, Reactive Flows

BOOKS AND OTHER EDUCATIONAL TOOLS

Author of "Modelling and Simulation of Reactive Flows", textbook, to appear.

Author of "Biofuels: Fundamentals, Modeling and Simulation" (in Portuguese), textbook, FBN 584.741 - Fundação Biblioteca Nacional, 2012

Author of "Introduction to Combustion" (in Portuguese), textbook, FBN 513.299, 2010.

Author of "Fundamentals of Numerical Calculus for Engineers" (in Portuguese), textbook, FBN 361.985, 2005.

Author of "Introduction to Computational Fluid Dynamics" (In Portuguese), textbook, Ed. UFRGS, 2000.

Editor of "Annals of CNMAC - Brazilian Congress of Computational and Applied Mathematics", 2010.

BOOK CHAPTERS

VAZ, F.A.; DE BORTOLI, A.L. Analytical/numerical solution for the Lagrangian flamelet model equations. IEEE – 2010, 3rd Southern Conference on Computational Modeling, 24-30.

DE BORTOLI, A.L. Simulation of mixing and chemical reacting flows over a flat wall. In: Iu, V.P. (org.). Computational Methods in Engineering and Science. Evanston: Ashgabe Pub Co - USA, 2004, V. 1, 727-732.

QUADROS, R., DE BORTOLI, A. L. Optimization of aerodynamic shapes by means of inverse method. In: Iu, V.P.. (org.). Computational Methods in Engineering and Science. Evanston: Ashgate Pub Co - USA, 2004, Vol. 1, 703-710.

DE BORTOLI, A.L. . Three-dimensional aerodynamical wing investigations based on structured meshes. In: João Bento - Elsevier Science. Epmesc VII - Computational Methods in Engineering and Science, 1999, Vol. 2, 1505-1514.

RESEARCH MANAGEMENT

Supervision of 15 PhD thesis, 3 post doctoral works and 30 Master thesis since 1998. Researcher of CNPq - National *Council* for Scientific and Technological Development, Brazil, since 2004.

RESEARCH INTERESTS

Development of reduced kinetic mechanisms for flames of biofuels Modeling and simulation of reactive flows Process of generating energy from plant sources: Development of fuel cells Numerical modeling of diagenetic processes and their impact on the quality of reservoirs

PAPERS IN REFEREED JOURNALS (see http://lattes.cnpq.br/8466423633226889)

More than 30 papers published in Mathematical and Computer Modeling, Journal of Mathematical Chemistry, Mathematical and Computer Modeling of Dynamical Systems, Applied Mathematics and Computation, Journal of Fluids and Structures, Annals of Brazilian Academy of Sciences, International Journal for Numerical Methods in Fluids, Journal of non-Newtonian Fluid Mechanics, Applied Numerical Mathematics, Concurrency and Computation. Practice & Experience, Journal of Computational and Applied Mathematics, Progress in Computational Fluid Dynamics, Latin American Applied Research, Engineering Applications of Computational Fluid Mechanics, among others.

More than 70 presentations in conferences.

EXAMPLES OF PUBLICATIONS

CARPES, C.Q., DE BORTOLI, A.L.. Numerical analysis of the acoustics of a diffusion flame. Journal of Computational and Applied Mathematics, 2015.

PEREIRA, F.N., ANDREIS, G.S.L., DE BORTOLI, A.L., MARCÍLIO, N.R.. Development of an analytical-numerical solution for a steady and axisymmetric turbulent jet diffusion flame for the hydrogen based on a reduced kinetic mechanism. Applied Mathematical Modelling, v. 38, p. 1315-1325, 2014.

VAZ, F.A., DE BORTOLI, A.L.. A new reduced kinetic mechanism for turbulent jet diffusion flames of bioethanol. Applied Mathematics and Computation, v. 247, p. 918-929, 2014.

LORENZZETTI, G., DE BORTOLI, A.L., MARCZAK, L.D.F. Existence of solutions for the Eulerian flamelet model equations. Mathematical and Computer Modelling, v. 57, 2196-2206, 2013.

LORENZZETTI, G., VAZ, F. A., DE BORTOLI, A.L. Development of reduced reaction mechanisms for hydrogen and methanol diffusion flames. Mathematical and Computer Modelling, v. 57, 2316-2324, 2013.

PEREIRA, A. L., GOMES, S. C. P., DE BORTOLI, A.L. A new formalism for the dynamic modeling of cables. Mathematical and Computer Modelling of Dynamical Systems, v. 19, 263-276, 2013.

ANDREIS, G.S.L., VAZ, F. A., DE BORTOLI, A.L. Bioethanol combustion based on a reduced kinetic mechanism. Journal of Mathematical Chemistry, v. 51, 1584-1598, 2013.

LORENZZETTI, G., DE BORTOLI, A.L., MARCZAK, L.D.F. A numerical method for the solution of confined co-flowing jet diffusion flames. Latin American Applied Research, v. 42, 27-32, 2012.

DE BORTOLI, A.L., ANDREIS, G.S.L., Asymptotic analysis for coupled hydrogen, carbon monoxide, methanol and ethanol reduced kinetic mechanisms. Latin American Applied Research, v. 42, 299-304, 2012.

PEREIRA, F. N., ANDREIS, G.S.L., DE BORTOLI, A.L., MARCILIO, N. R. Analytical-numerical solution for turbulent jet diffusion flames of hydrogen. Journal of Mathematical Chemistry, v. 51, 556-568, 2012.

DE BORTOLI, A. L., VAZ, F. A., LORENZZETTI, G., MARTINS, I. Systematic reduction of combustion reaction mechanisms of common hydrocarbon and oxygenated fuels. AIP Conference Proceedings, v. 1281, 558-561, 2010.

DE BORTOLI, A. L. Analytical/numerical solution for confined jet diffusion flames (SANDIA flame C). Latin American Applied Research, v. 39, 157-163, 2009.

BEDIN, L., THOMPSON, M., DE BORTOLI, A. L. Mixing and reacting flows with inflow-outflow boundary conditions. Nonlinear Analysis: Real World Applications, v. 9, 438-470, 2008.

DE BORTOLI, A. L. Large eddy simulation of a confined jet diffusion flame using a finite difference method. Progress in Computational Fluid Dynamics, v. 8, 379-383, 2008.

CARVALHO, S., SAMIOS, D., NETZ, P. A., JUSTO, D. A. R., DE BORTOLI, A. L. Numerical simulation of biological base pairs considering geometric and energetic criteria. Applied Mathematics and Computation, v. 200, 602-609, 2008.

DE BORTOLI, A. L. Simulation of a confined turbulent nonpremixed piloted methane jet flame. Engineering Applications of Computational Fluid Mechanics, v. 1, 337-349, 2007.

QUADROS, R., DE BORTOLI, A.L., C. TROPEA . Boundary layer control by means of plasma actuators. American Institute of Physics Conference (AIP), v. 936, 663-665, 2007.

DE BORTOLI, A. L. Aeroelastic analysis of panels submitted to compressible flows. Journal of Fluids and Structures, v. 20, 189-195, 2005.

BARBOZA, H. H. C., DE BORTOLI, A. L., SIMÕES, J. C., CUNHA, R., BRAUN, M. Bidimensional numerical simulation of the ice movement at Lange Glacier King George Island, Antarctic . Anais da Academia Brasileira de Ciências, v. 4, 67-76, 2004.

DE BORTOLI, A. L., QUADROS, R. Euler solutions for aerodynamic inverse shape design. International Journal for Numerical Methods in Fluids, v. 44, n.2, 197-208, 2004.

MANICA, R., DE BORTOLI, A. L. Simulation of sudden expansion flows for power-law fluid. Journal of Non-Newtonian Fluid Mechanics, v. 121, n.1, 35-40, 2004.

DE BORTOLI, A. L. Mixing and chemical reacting flow simulation inside square cavities. Applied Numerical Mathematics, v. 47, n.3, 295-303, 2003.

CALDERON, A. U. Z., THOMPSON, M., DE BORTOLI, A. L. Analysis and simulation for a system of chemical reaction equations with a vortex formation. Applied Numerical Mathematics, v. 47, n.3, 559-573, 2003.

DE BORTOLI, A. L. Multigrid based aerodynamical simulations for the NACA 0012 airfoil. Applied Numerical Mathematics, v. 40, n.1, 337-349, 2002.

DE BORTOLI, A. L., THOMPSON, M., CALDERON, A. U. Z. Numerical simulation for rotating internal weakly viscoelastic flows in rectangular ducts. International Journal for Numerical Methods in Fluids, v. 39, n.6, 485-496, 2002.

CUNHA, R., DE BORTOLI, A. L. A parallel NAVIER-STOKES solver for the rotating flow problem. Concurrency and Computation. Practice & Experience, v. 13, n.3, 163-180, 2001.

DE BORTOLI, A. L. Three-dimensional supersonic flow analysis over a satellite vehicle launcher. Journal of Computational and Applied Mathematics, v. 103, 33-41, 1999.

DE BORTOLI, A. L. Convergence acceleration applied to compressible and incompressible fluid flow calculations. Journal of the Brazilian Society of Mechanical Sciences and Engineering, v. XIX, 357-370, 1997. NASA/SP – 1998/SUPPL 374 Aeronautical Engineering: A Continuing Bibliography with Indexes.

TO APPEAR:

GOMES, R. S., ANDREIS, G.S.L., DE BORTOLI, A.L., Development of a reduced kinetic mechanism for n-heptane diffusion flames.

FRANCISQUETTI, E.P., CARPES, C.Q., DE BORTOLI, A.L., A numerical method for the combustion of methane in porous media.

PROFESSIONAL ASSOCIATIONS MEMBERSHIPS

Reviewer for

Journal of the Brazilian Society of Mechanical Sciences and Engineering Brazilian Journal of Chemical Engineering International Journal for Numerical Methods in Fluids Journal of Computational and Applied Mathematics Drying Technology Journal of Fluid Mechanics Applied Mathematics Modelling Engineering Applications of Computational Fluid Mechanics