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Filière International Business Management

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Projets et mandats de recherche

2012 - 2015	**Numerical simulation of 3D impulse waves (requérant principal)** Réserve stratégique de la Haute Ecole Spécialisée de la Suisse occidentale (HES-SO)
2012 - 2015	**Numerical simulation of 3D impulse waves (co-requérant, avec M. Picasso)** Fonds National de la recherche scientifique
2013	**Mandat de recherche (avec Ycoor systems SA)** Bühler AG, Suisse
2013 - 2014	**Ajout de deux modules: multiphase et multiphysique dans le logiciel cfsFlow (senior personnel)** Commission pour la technologie et l'innovation (CTI). Collaboration Ycoor systems SA-EPFL
2012	**Mandat de recherche (avec Ycoor systems SA)** Rio Tinto Alcan, France
2012	**Mandat de services (requérant principal)** Ecole Polytechnique Fédérale de Lausanne (EPFL). Développement d'une plateforme de gestion de tests pour la logiciel de simulation cfsFlow.
2011	**Mandat de recherche (avec Ycoor systems SA)** Rio Tinto Alcan, France
2010	**Mandat de recherche (avec Ycoor systems SA)** Rio Tinto Alcan, France
2009 – 2011	**Collaborative Research: Numerical Methods for Fully or Implicitly Nonlinear Elliptic Equations (co-requérant, avec R. Glowinski et D. C. Sorensen)** US National Science Foundation, Project number 0913982
2007	**Primal-Dual Optimization Methods for the Minimization of the Gibbs Free Energy in Atmospheric Aerosol Particles (requérant principal)** University of Houston New Faculty Internal Grants
2005 – 2007	**Fundamental Modeling of the Physical State of Atmospheric Particles and Application to 3D Air Quality Models (senior personnel)** US Environmental Protection Agency, Star grant
2004 – 2005	**Problèmes d'optimisation liés à la modélisation de la qualité de l'air (réquerant principal)** Fonds National de la recherche scientifique. Bourse de chercheur débutant.

Activités d'enseignement

2011 – 2013	**Mathematics 1 (Business Administration, major in International Management)** Calculus (Functions, lines, derivatives).
2011 – 2013	**Mathematics 2 (Business Administration, major in International Management)** Calculus (derivatives, Newton's method, linear approximation, elasticity), Financial mathematics, linear algebra.

2011 -	**Mathematics 3 (Business Administration, major in International Management)** Calculus (derivatives, optimization with one variable). Linear programming. Multivariate calculus (functions with two variables, partial derivatives, optimization with two variables, constrained optimization).
2011 -	**Mathematics 4 (Business Administration, major in International Management)** Monte-Carlo simulation. Calculus (integration, differential equations), Option pricing (Black&Scholes model, Brownian motion, Monte-Carlo simulation), Game theory.
2011 – 2013	**Statistics 1 (Business Administration, major in International Management)** Descriptive statistics : graphs (histograms, ogives), measures of location and variability. Concentration index. Contigency tables. Linear regression.
2011 – 2013	**Statistics 2 (Business Administration, major in International Management)** Probability : Combinatorics, counting techniques, rules of probability, discrete random variables (Binomial, negative binomial, Poisson, hypergeometric), continuous random variables (Normal, uniform, exponential).
2011 – 2013	**Statistics 3 (Business Administration, major in International Management)** Inferential statistics : sampling, tests for the mean, for the proportion, for the variance, tests for comparison of two means, paired samples, non-parameteric tests (adequation, independence, Wilcoxon).
2011 - 2013	**Multivariate statistics (Business Administration, major in International Management)** Multivariate statistics : ANOVA, Multiple linear regression, Principal component analysis, Logistic regression.
2011 -	**Cours Euler (EPFL).** Cours de mathématiques pour enfants à haut potentiel. Cours d'analyse et de proabilités et statistiques (niveau première année EPFL)
2010	**Mathématiques 1 et 2 (filière Economie d'entreprise)** Fonctions et dérivées. Mathématiques financières. Algèbre linéaire et matrices.
2010	**Statistiques 1 et 2 (filière Economie d'entreprise)** Statistiques descriptives et probabilités.
2010	**Mathématiques 4 (Economie d'entreprise)** Simulation de Monte-Carlo. Intégration. Modèle de Black & Scholes.
2011-2012	**Mathématiques (Passerelle EHG-HEG)** Fonctions et dérivées. Mathématiques financières. Algèbre linéaire et matrices
2010	**Mathématiques pour ingénieurs** Haute Ecole du Paysage, de l'ingénierie et architecture (HEPIA)
2004-2008	**Divers cours (University of Houston, Houston, Texas)** • Introduction to Statistics • Introduction to partial differential equations • Numerical analysis (bachelor) • Numerical analysis (master) • Calculus.
2003	**Systèmes continus et discrets (Université de Beyrouth, Liban)** Master en modélisation et informatique.
2002-2003	**Compléments d'analyse numérique (EPFL)** Module programme master en génie électrique.

Activités professionnelles

2013 -	**Responsable de filière, International Business Management** Haute Ecole de Gestion de Genève (HES-SO)
2012 -	**Chargé d'enseignement HES** Haute Ecole de Gestion de Genève (HES-SO)
2010 -	**Adjunct Professor of mathematics** Department of mathematics, University of Houston, Houston, Texas

2010 - 2013	**Project manager / Software developer** Ycoor Systems SA, Sierre
2010 - 2013	**Collaborateur scientique** Institut MATHICSE, Ecole Polytechnique Fédérale de Lausanne
2010-2012	**Chargé de cours HES** Haute Ecole de Gestion de Genève (HES-SO)
2005 - 2010	**Assistant Professor** Department of Mathematics, University of Houston, Houston, Texas
2004 – 2005	**Visiting Assistant Professor** Department of Mathematics, University of Houston, Houston, Texas
2001 – 2004	**Assistant - doctorant** Chaire d'analyse et simulation numériques, Ecole Polytechnique Fédérale de Lausanne

Diplômes

2012	**Attestation didactique** Haute Ecole Spécialisée de Suisse Occidentale (HES-SO)
2003	**Ph.D. thesis, doctor es science** Ecole Polytechnique Fédérale de Lausanne (EPFL) *Analysis and Numerical Simulation of Free Surface Flows* Thèse numéro 2893, sous la direction du Prof. J. Rappaz Prix EPFL de doctorats 2013
2000	**Diplôme d'études postgrade en ingénierie mathématique / M.S. degree in mathematical engineering** Ecole Polytechnique de Paris et Ecole Polytechnique Fédérale de Lausanne (EPFL)
2000	**Diplôme d'ingénieur mathématicien (Bachelor and Master)** Ecole Polytechnique Fédérale de Lausanne (EPFL)

Publications

2013	**On the Modeling and Simulation of Non-Hydrostatic Dam Break Flows** A. Caboussat, S. Boyaval, A. Masserey, Computing and Visualization in Science, 2013. DOI:10.1007/s00791-013-0190-7.
2013	**A Least-Squares Method for the Numerical Solution of the Dirichlet Problem for the Elliptic Monge-Ampère Equation in Dimension Two** A. Caboussat, R. Glowinski, D. C. Sorensen. ESAIM: Control, Optimization and Calculus of Variations, 2013. DOI:10.1051/cocv/2012033
2012	**Regularization methods for the Numerical Solution of the Divergence Equation** A. Caboussat, R. Glowinski. J. Comp. Math., 30(4), 354--380, 2012.
2012	**Numerical Simulation of Two-Phase Flow with Interface Tracking by Adaptive Eulerian Grid Subdivision** A. Caboussat, P. Clausen, J. Rappaz. Mathematical and Computer Modelling, 55, 490--504, 2012.
2011	**Large Gas Bubbles under the Anodes of Aluminum Electrolysis Cells** A. Caboussat, L. I. Kiss, J. Rappaz, K. Vekony, A. Perron, S. Renaudier, O. Martin, Light Metals 2011, 581--586, (ed. S. J. Lindsay), John Wiley & Sons, Inc., Hoboken, NJ, USA. 2011.
2011	**Mathematical Modeling of Atmospheric Flow and Numerical Computation of Convex Envelopes** A. Caboussat, Mathematical Models in Natural Phenomena, 6(5), 44--66, 2011.
2011	**Numerical Algorithms for Free Surface Flow** A. Caboussat, G. Jouvet, M. Picasso, J. Rappaz, in *Computational Fluid Dynamics*, pages

263--326, Frédéric Magoules editor, CRC Press, Taylor & Francis, Numerical analysis and scientific computation series, 2011.

2011	**Primal-Dual Interior-Point Method for Thermodynamic Gas-Particle Partitioning** A. Caboussat, Comp. Optim. and Appl., 48, 717--745, 2011.
2010	**Looking for the Best Constant in a Sobolev Inequality : A Numerical Approach** A. Caboussat, R. Glowinski, A. Leonard. Calcolo, 47(4), 211--238, 2010.
2010	**Optimization Problem Coupled with Differential Equations: A Numerical Algorithm mixing an Interior-Point Method and Event Detection** A. Caboussat, C. Landry, J. Rappaz, Journal of Optimization, Theory and Applications, 147(1), 141--156, 2010
2010	**Numerical Methods for the Vector-Valued Solutions of Non-Smooth Eigenvalue Problems** A. Caboussat, R. Glowinski, J. Sci. Comp., 45(1-3), 64--89, 2010.
2010	**Numerical Solution of a Variational Problem Arising in Stress Analysis: the Vector Case** A. Caboussat, R. Glowinski, Discrete and Continuous Dynamical Systems, Series A, 27(4), 1447--1472, 2010.
2010	**Numerical Approximation of Electromagnetic Signals Arising in the Evaluation of Geological Formations** A. Caboussat, G. K. Miers, Computers and Mathematics with Applications, 59, 338--351, 2010.
2009	**Mass Conservative, Positive Definite Integrator for Atmospheric Chemical Dynamics** K. Nguyen, A. Caboussat, D. Dabdub, Atmospheric Environment, 43(40), 6287--6295, 2009
2009	**Numerical Solution and Fast-Slow Decomposition of a Population of Weakly Coupled Systems** A. Caboussat, A. Leonard, DCDS Supplements, 2009(Special), 123--132, 2009. Proceedings of the 7th AIMS Conference, Arlington, Texas, May 2008.
2009	**Solving Optimization-Constrained Differential Equations with Discontinuity Points, with Application to Atmospheric Chemistry** C. Landry, A. Caboussat, E. Hairer, SIAM J. Sci. Comp., 35(1), 3806--3826, 2009. This article has been cited by SIAM for public awareness in the Mathematics for Planet Earth 2013 initiative (http://www.siam.org/publicawareness/mpe2013.php)
2009	**An Augmented Lagrangian Approach to the Numerical Solution of a Non-Smooth Eigenvalue Problem** A. Caboussat, R. Glowinski, V. Pons, J. Numer. Math., 17(1), 3--26, 2009.
2009	**Numerical Solution of a Non-Smooth Variational Problem Arising in Stress Analysis : The Scalar Case** A. Caboussat, R. Glowinski, Int. J. Numerical Analysis and Modeling 6(3), 402--419, 2009.
2009	**Numerical Methods for Non-Smooth L^1 Optimization: Applications to Free Surface Flows and Image Denoising** A. Caboussat, R. Glowinski, V. Pons, Int. J. Numerical Analysis and Modeling 6(3), 355--374, 2009.
2009	**A Numerical Method for a Non-Smooth Advection-Diffusion Problem Arising in Sand Mechanics** A. Caboussat, R. Glowinski, Com. Pure. Appl. Anal. 8(1), 161--178, 2009.
2008	**A second order scheme for solving optimization-constrained differential equations with discontinuities** A. Caboussat, C. Landry, in *Numerical Mathematics and Advanced Applications*, 761--768, Springer Verlag, Berlin, 2008. Proceedings of Enumath 2007, the 7th European Conference on Numerical Mathematics and Advanced Applications, Graz, Austria, September 2007.
2008	**A Numerical Method for Fluid Flows with Complex Free Surfaces** A. Bonito, A. Caboussat, M. Picasso and J. Rappaz, in *Partial Differential Equations: Modeling and Simulation*, 187--208, R. Glowinski and P. Neittaanmaki eds., Springer, 2008.

2008	**A Numerical Method for Interface Reconstruction of Triple Points within a Volume Tracking Algorithm** A. Caboussat, M. M. Francois, R. Glowinski, D. B. Kothe, J. M. Sicilian, Los Alamos National Laboratory technical report LA-UR-07-7960, Mathematical and Computer Modelling, 48, 1957--1971, 2008.
2008	**Modeling and Computation of the Shape of a Compressed Axisymmetric Gas Bubble** A. Caboussat, R. Glowinski, J. Numer. Math., 16(2), 107--117, 2008
2008	**Numerical Method for a Dynamic Optimization Problem arising in the Modeling of a Population of Aerosol Particles** A. Caboussat, A. Leonard, C. R. Acad. Sci. Paris, 346(11-12), 677-680, 2008.
2007	**Dynamic Optimization and Event Location in Atmospheric Chemistry** A. Caboussat, C. Landry, Proc. Appl. Math. Mech. (PAMM), 7(1), 2020035--2020036, 2007. Special Issue: Sixth International Congress on Industrial Applied Mathematics (ICIAM07).
2007	**A new atmospheric aerosol phase equilibrium model (UHAERO): organic systems** N. R. Amundson, A. Caboussat, J. W. He, A. V. Martynenko, C. Landry, C. Tong, and J. Seinfeld, Atmos. Chem. Phys., 7, 4675--4698, 2007.
2007	**A phase equilibrium model for atmospheric aerosols containing inorganic electrolytes and organic compounds (UHAERO), with application to dicarboxylic acids** N.R. Amundson, A. Caboussat, J. W. He, A.V. Martynenko, and J.H. Seinfeld, J. Geophys. Res., 112, D24S13, doi:10.1029/2007JD008424, 2007.
2007	**Modeling and Simulation of Liquid-Gas Free Surface Flows** A. Caboussat, M. Picasso, J. Rappaz, in *Free and Moving Boundaries: Analysis, Control and Simulation*, Lecture Notes in Pure and Applied Mathematics, Volume 252. Chapman and Hall/CRC, 2007.
2007	**A Dynamic Optimization Problem Related to Organic Aerosols** N. R. Amundson, A. Caboussat, J. W. He, C. Landry, J. Seinfeld, C. R. Acad. Sci. Paris, 344(8), 519--522, 2007.
2006	**Computation of the Normal Vector to a Free Surface by a Finite Element - Finite Volume Mixed Method** A. Caboussat, R. Glowinski, J. M. Sicilian, C. R. Acad. Sci. Paris, 343(6), 431--436, 2006.
2006	**A new inorganic atmospheric aerosol phase equilibrium model (UHAERO)** N. R. Amundson, A. Caboussat, J. W. He, A.V. Martynenko, V.B. Savarin, J.H. Seinfeld, K.-Y. Yoo, Atmos. Chem. Phys., 6, 975--992, 2006.
2006	**A Primal-Dual Interior Point Method for the Resolution of an Optimization Problem related to the Modeling of Atmospheric Organic Aerosols** N. R. Amundson, A. Caboussat, J. W. He, J. Seinfeld, Journal of Optimization, Theory and Applications, 130(3), 375--407, 2006.
2006	**A Primal-Dual Active Set Algorithm for Chemical Equilibrium Problems Related to the Modeling of Atmospheric Inorganic Aerosols** N. R. Amundson, A. Caboussat, J. W. He, J. Seinfeld, K.-Y. Yoo, Journal of Optimization, Theory and Applications, 128(3), 469--498, 2006.
2006	**A Numerical Method for the Simulation of Free Surface Flows with Surface Tension** A. Caboussat, Computers and Fluids, 35(10), 1205--1216, 2006.
2005	**Analysis of a One-Dimensional Free Surface Problem** A. Caboussat, J. Rappaz, Numer. Math., 101(1), 67--86, 2005.
2005	**A Two-Grids/Projection Algorithm for Obstacle Problems** A. Caboussat, R. Glowinski, Computers and Mathematics with Applications, 50, 171--178, 2005.
2005	**An Optimization Problem related to the Modeling of Organic Aerosols** N. R. Amundson, A. Caboussat, J. W. He, J. Seinfeld, C. R. Acad. Sci., 340(10), 765--768, 2005.
2005	**Numerical Simulation of Two-Phase Free Surface Flows** A. Caboussat, Archives of Computational Methods in Engineering, 12(2), 165--210, 2005.

2005	**An Optimization Problem related to the Modeling of Inorganic Aerosols** N. R. Amundson, A. Caboussat, J. W. He, J. Seinfeld, K.-Y. Yoo, C. R. Acad. Sci., 340(9), 683-686, 2005.
2005	**On the Use of a Two-Grids Method in the Numerical Simulation of Free Boundary Problems** A. Caboussat, R. Glowinski, Proceedings LACSI symposium, Santa Fe, NM, 2004.
2005	**Numerical Simulation of Free Surface Incompressible Liquid Flows surrounded by Compressible Gas** A. Caboussat, M. Picasso, J. Rappaz, J. Comp. Phys., 203(2), 626-649, 2005.
2003	**Analysis and Numerical Simulation of Free Surface Flows** A. Caboussat, PhD Thesis 2893, Ecole Polytechnique Fédérale de Lausanne, 2003.
2003	**Numerical Simulation of Three Dimensional Free Surface Flows with Bubbles** A. Caboussat, V. Maronnier, M. Picasso, J. Rappaz, Lecture Notes in Computational Science and Engineering, Springer, volume 35, 2003, 69--86.

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