

## **PUBLICATIONS OF PROF. GERARD DEGREGZ**

51 archival journal publications

150 conference papers

### **Archival Journal Publications (last 10 years)**

(Total JCR Impact Factor 43,937)

COUSSEMENT, A., GICQUEL, O., FIORINA, B., DEGREGZ, G., DARABIHA, N.

Multicomponent real gas 3-D-NSCBC for direct numerical simulation of reactive compressible viscous flows. (2013) *Journal of Computational Physics*, 245, pp. 259-280.

(JCR Impact Factor 2,31)

ATANASOVA, M., SOBOTA, A., BROK, W., DEGREGZ, G., VAN DER MULLEN, J.J.A.M.

Driving frequency dependence of capacitively coupled plasmas in atmospheric argon. (2012) *Journal of Physics D: Applied Physics*, 45 (33), art. no. 335201

(JCR Impact Factor 2,544)

COUSSEMENT, A., GICQUEL, O., CAUDAL, J., FIORINA, B., DEGREGZ, G.

Three-dimensional boundary conditions for numerical simulations of reactive compressible flows with complex thermochemistry. (2012) *Journal of Computational Physics*, 231 (17), pp. 5571-5611.

(JCR Impact Factor 2,31)

SALHI, Y., SI-AHMED, E.-K., DEGREGZ, G., LEGRAND, J.

Numerical investigations of passive scalar transport in turbulent taylor-couette flows: Large eddy simulation versus direct numerical simulations. (2012) *Journal of Fluids Engineering, Transactions of the ASME*, 134 (4), art. no. 041105

(JCR Impact Factor 0,747)

ATANASOVA, M., CARBONE, E.A.D., MIHAILOVA, D., BENOVA, E., DEGREGZ, G., VAN DER MULLEN, J.J.A.M.

Modelling of an RF plasma shower. (2012) *D: Applied Physics*, 45 (14), art. no. 145202

(JCR Impact Factor 2,544)

COUSSEMENT, A., GICQUEL, O., DEGREGZ, G.

Large eddy simulation of a pulsed jet in cross-flow. (2012) *Journal of Fluid Mechanics*, 695, pp. 1-34.

(JCR Impact Factor 2,459)

ATANASOVA, M., CARBONE, E.A.D., MIHAILOVA, D., VAN DIJK, J., VAN DER MULLEN, J.J.A.M., BENOVA, E., DEGREGZ, G.

Two-dimensional modeling of the active species flow generated by an atmospheric plasma jet. (2011) *IEEE Transactions on Plasma Science*, 39 (11 PART 1), art. no. 5773502, pp. 2348-2349.

(JCR Impact Factor 1,174)

PEERENBOOM, K.S.C., VAN DIJK, J., GOEDHEER, W.J., DEGREGZ, G., VAN DER MULLEN, J.J.A.M.

A finite volume model for multi-component diffusion in magnetically confined plasmas. (2011) *Journal of Physics D: Applied Physics*, 44 (19), art. no. 194006.

(JCR Impact Factor 2,544)

MIHAILOVA, D., VAN DIJK, J., GROZEVA, M., DEGREGZ, G., VAN DER MULLEN, J.J.A.M.  
Towards a reduced chemistry module of a He-Ar-Cu hollow cathode discharge. (2011) *Journal of Physics D: Applied Physics*, 44 (19), art. no. 194001 .  
(JCR Impact Factor 2,544)

LAMBERT, P., MASTRANGELI, M., VALSAMIS, J.-B., DEGREGZ, G.  
Spectral analysis and experimental study of lateral capillary dynamics for flip-chip applications. (2010) *Microfluidics and Nanofluidics*, 9 (4-5), pp. 797-807.  
(JCR Impact Factor 3,371)

RASQUIN, M., DECONINCK, H., DEGREGZ, G.  
FlexMG: A new library of multigrid preconditioners for a spectral/finite element incompressible flow solver. (2010) *International Journal for Numerical Methods in Engineering*, 82 (12), pp. 1510-1536.  
(JCR Impact Factor 2,009)

SALHI, Y., SI-AHMED, E.-K., LEGRAND, J., DEGREGZ, G.  
Stability analysis of inclined stratified two-phase gas-liquid flow. (2010) *Nuclear Engineering and Design*, 240 (5), pp. 1083-1096.  
(JCR Impact Factor 0,765)

DEGREGZ, G., LANI, A., PANESI, M., CHAZOT, O., DECONINCK, H.  
Modelling of high-enthalpy, high-Mach number flows. (2009) *Journal of Physics D: Applied Physics*, 42 (19), art. no. 194004.  
(JCR Impact Factor 2,544)

PANESI M., RINI P., DEGREGZ G., CHAZOT O.  
Analysis of chemical non-equilibrium and elemental demixing in the VKI Plasmatron, *Journal of Thermophysics and Heat Transfer*, January - March 2007, Vol. 21, Issue 1, pp. 57-66  
(JCR Impact Factor 0,739)

RINI P., VAN DEN ABEELE D., DEGREGZ G.  
Analysis of diffusion phenomena in CO<sub>2</sub>/N<sub>2</sub> mixtures under thermochemical equilibrium, *Journal of Thermophysics and Heat Transfer*, January - March 2007, Vol. 21, Issue 1, pp. 28-39  
(JCR Impact Factor 0,739)

RINI P., VAN DEN ABEELE D., DEGREGZ G.  
Elemental demixing in inductively coupled air plasma torches at high pressures, *Journal of Thermophysics and Heat Transfer*, January - March 2006, Vol. 20, Issue 1, pp. 31-40  
(JCR Impact Factor 0,739)

RINI P., VAN DEN ABEELE D., DEGREGZ G.  
Closed form for the equations of chemically reacting flows under local thermodynamic equilibrium, *Physical Review E*, 2005, Vol. 72, 2005  
(JCR Impact Factor 2,255)

VAN DEN ABEELE D. & DEGREGZ G.

Similarity analysis for the high-pressure inductively coupled plasma source, *Plasma Sources Science and Technology*, 2004, Vol. 13, pp. 680-690  
(JCR Impact Factor 2,521)

MAGIN T. & DEGREGZ G.

Transport properties of partially ionized and unmagnetized plasmas, 2004, *Physical Review E*, Vol. 70, article 046412  
(JCR Impact Factor 2,255)

RINI P. & DEGREGZ G.

Elemental demixing in air and carbon dioxide stagnation line flows, *Journal of Thermophysics and Heat Transfer*, 2004, Vol. 18, Issue 4, pp. 511-518  
(JCR Impact Factor 0,739)

MAGIN T. & DEGREGZ G.

Transport algorithms for partially ionized and unmagnetized plasmas, *Journal of computational physics*, 2004, Vol. 198, pp. 424-449  
(JCR Impact Factor 2,31)

BOTTIN B., CARBONARO M., CHAZOT O., DEGREGZ G., VANDEN ABEELE D., BARBANTE P.F., PARIS S., VAN DER HAEGEN V., MAGIN T., PLAYEZ M.

A decade of aerothermal plasma research at the von Karman Institute, *Contributions to Plasma Physics*, 2004, Vol. 44, Issue 5-6, pp. 484-489  
(JCR Impact Factor 1,108)

DEGREGZ G., VAN DEN ABEELE D., BARBANTE P.F., BOTTIN B.

Numerical simulation of inductively coupled plasma flows under chemical non-equilibrium, *International Journal of Numerical Methods for Heat and Fluid Flow*, 2004, Vol. 14, Issue 4, pp. 538-558  
(JCR Impact Factor 0,752)

RINI P., GARCIA A., MAGIN T., DEGREGZ G.

Numerical simulation of CO<sub>2</sub> non-equilibrium flows with catalyzed surface reactions, *Journal of Thermophysics and Heat Transfer*, January - March 2004, Vol. 18, Issue1, pp. 114-121  
(JCR Impact Factor 0,739)

D.O. SNYDER, G. DEGREGZ

Large-eddy simulation with complex 2-D geometries using a parallel finite-element/spectral algorithm, *International Journal for Numerical Methods in Fluids*, April 2003, Vol. 41, Issue 10, pp.1119-1135  
(JCR Impact Factor 1,176)

## **Editor of Books**

EUCASS 2007: Proceedings of the 2<sup>nd</sup> European Conference for Aero-Space Sciences, 2007, edited by M.L. Riethmuller & G. Degrez, von Karman Institute for Fluid Dynamics, Rhode-St-Genèse, Belgium, ISBN 978-2-930389-27-3

CFVL 2004 – Recueil des Actes du 9<sup>ème</sup> Congrès Francophone de Vélocimétrie Laser, 2004, edited by M.L. Riethmuller & G. Degrez, von Karman Institute for Fluid Dynamics, Rhode-St-Genèse, Belgium, ISBN 2-930389-12

## **Contributions to books**

CORDARO T. & DEGREZ G.

High order P3 Hermite triangular finite element for transport and incompressible flow problems, In “Proceedings of the 5th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008)”, 2008, CIMNE, ISBN: 978-84-96736-55-9

CORDARO T. & DEGREZ G.

High order P3 Hermite triangular finite element for transport and incompressible flow problems, In “Proceedings of the 4th International Conference on Advanced Computational Methods in Engineering (ACOMEN 2008)”, 2008, Université de Liège, Liège, Belgium, ISBN 951-39-1868-8

RASQUIN M., VIRÉ A., DJOUDI Z., DETANDT Y., DEGREZ G.

Numerical simulations of unsteady flows around re-entry capsules, In “Proceedings of the 2nd European Conference for Aero-Space Sciences (EUCASS 2007)”, 2007, edited by M.L. Riethmuller & G. Degrez, von Karman Institute for Fluid Dynamics, Rhode-St-Genèse, Belgium, ISBN 978-2-930389-27-3

DETANDT Y., DEGREZ G., CARO, S.

Hybrid approach for the simulation of aerodynamic noise, In “Proceedings of the 2nd European Conference for Aero-Space Sciences (EUCASS 2007)”, 2007, edited by M.L. Riethmuller & G. Degrez, von Karman Institute for Fluid Dynamics, Rhode-St-Genèse, Belgium, ISBN 978-2-930389-27-3

DETANDT Y., DEGREZ G., SCHRAM C.

Jet flow aeroacoustics at Re=14000: comparison between experimental and numerical simulations, In “Proceedings of the 13th AIAA/CEAS Aeroacoustics Conference (28th AIAA Aeroacoustics Conference)”, 2007, AIAA, ISBN 978-1-56347-896-3

VANDEN ABEELE D., RINI P., DEGREZ G.

An improved derivation of the equations of chemically reacting flow under local thermodynamic equilibrium, In “Proceedings of the 13th International Conference on Methods of Aerophysical Research (ICMAR 2007)”, 2007, Institute of Theoretical and Applied Mechanics SB RAS, Vol. 5, ISBN 978-5-98901-020-2

DETANDT Y., DEGREGZ G., CARO S.

Jet flow induced noise computed using Large Eddy Simulations, In "Proceedings of the 2006 International Conference on Modal Analysis Noise and Vibration Engineering", 2006, P. Sas (Ed.), KUL

LANI A., MOLNAR J., VANDEN ABEELE D., RINI P., MAGIN T., DEGREGZ G.

Numerical study of elemental demixing in atmospheric entry flow regimes near local thermodynamic equilibrium, In "Proceedings of the European Conference on Computational Fluid Dynamics (ECCOMAS CFD 2006)", 2006, TU Delft, Delft, The Netherlands, ISBN: 90-9020970-0

BAUMGART J., MAGIN T., RINI P., DEGREGZ G., CHAZOT O.

simulation of entry in the true mars atmosphere, In ESA SP 563, "Proceedings of 5th European Symposium on Aerothermodynamics for Space Vehicles", February 2008, Danesey, D. ed., ESA, ISBN 92-9092-874-3, pp. 593-598

RINI P., KOLESNIKOV A. F., VASIL'EVSKII S. A., CHAZOT O., DEGREGZ G.

High temperature CO2 stagnation line flows: a code-to-code comparison, In "Proceedings of the 12th International Conference on Methods of Aerophysical Research (ICMAR 2004)", 2004, Institute of Theoretical and Applied Mechanics SB RAS, ISBN 593-08-9004-8

VAN DEN ABEELE D., DEGREGZ G., SNYDER D.O.

Parallel turbulent flow computations using a hybrid spectral/finite-element method on Beowolf clusters, In "Computational fluid dynamics 2004: proceedings of the Third International Conference on Computational Fluid Dynamics, ICCFD3", edited by C. Groth, D. W. Zingg, Springer, 2004, ISBN 978-3-54031-800-2

DIEBEL J., MAGIN T., PANESI M., RINI P., VAN DEN ABEELE D., DEGREGZ G.

Simulation of supersonic flows in inductively coupled plasma tunnels, In "Computational fluid dynamics 2004: proceedings of the Third International Conference on Computational Fluid Dynamics, ICCFD3", edited by C. Groth, D. W. Zingg, Springer, 2004, ISBN 978-3-54031-800-2

DEGREGZ G., BARBANTE P.F., DE LA LLAVE PLATA M., MAGIN T., CHAZOT O.

Thermodynamic and transport properties of Martian atmosphere for space entry application, In "Proceedings of the 6th European congress on Computational Methods in Applied Sciences and Engineering. ECCOMAS Computational Fluid Dynamics Conference 2001", Eccomas, 2001, ISBN 0-905-091-12-4

SNYDER D.O. & DEGREGZ G.

A finite-element/spectral incompressible Navier-Stokes solver for eventual application to 2-D LES, In "Computational Fluid and Solid Mechanics, Proceedings of the first MIT Conference on Computational Fluid and Solid Mechanics", edited by K.J. Bathe, Elsevier, 2001, ISBN 978-0-08-043956-3

DEGREZ G., VAN DEN ABEELE D., BARBANTE P.F., BOTTIN B.

Numerical simulation of inductive plasma flows and hypersonic (re-)entry flows, In "ECCOMAS 2000: Proceedings of the 5<sup>th</sup> European Congress on Computational Methods in Applied Sciences and Engineering", European Committee on Computational Methods in Applied Science, 2000, ISBN 848-99-2570-4

VAN DEN ABEELE D. & DEGREZ G.

Analysis of thermal and chemical non-equilibrium effects in high-pressure inductive air plasmas, In "FLUCOME 200: Proceedings of the 6<sup>th</sup> International Symposium on Fluid Control, Measurement and Visualization", Université de Sherbrooke, 2000, ISBN 2-762-20126-8

DECONINCK H. & DEGREZ G.

Multidimensional upwind residual distribution schemes and applications, "Finite Volumes for Complex Applications II: 2<sup>nd</sup> International Symposium on Finite Volume for Complex Applications", Hermes Science Publications, 1999, ISBN 978-2-74-620057-9

ÖZGEN S., DEGREZ G., SARMA G. S. R., CARBONARO M.

Two-fluid-layer flow stability, In "Fluid Dynamics at Interfaces", 1999, W. Shyy & R. Narayanan, eds., Cambridge University Press, 1999, ISBN 978-0-52-164266-8

KNIGHT D. D. & DEGREZ G.

Shock wave boundary layer interactions in high Mach number flows. A critical survey of current CFD prediction capabilities, AGARD AR 319 on "Hypersonic Experimental and Computational Capability, Improvement and Validation", December 1998, Vol. 2, ISBN 92-836-1078-4

VAN DEN ABEELE D., BOTTIN B., DEGREZ G., BARBANTE P., SARMA, G. S. R.

Physico-chemical modelling for computational studies of high-temperature reactive flows in an inductive plasma wind tunnel, In "Proceedings of the 15<sup>th</sup> IMACS World Congress on Scientific Computation, Modelling and Applied Mathematics", edited by A. Sydow, World Congress on Scientific Com, 1997, ISBN 978-3-89-685550-3

ISSMAN E. & DEGREZ G.

Non-overlapping preconditioners for a parallel implicit Navier-Stokes solver, In "Proceedings of the International Conference on High-Performance Computing and Networking (HPCN Europe, 1997)", Lecture Notes in Computer Science, edited by B.Hertzberger, P. Sloot, Springer Verlag, June 1997, ISBN: 3-540-62898-3

ISSMAN E. & DEGREZ G.

Implicit time-integration and Newton iterative solvers for accelerating SUPG finite element and residual distribution methods, von Karman Institute Lecture Series on "Computational Fluid Dynamics", von Karman Institute LS 1997-02, 1997, ISSN 0377-8312

WILQUEM F., PASSELECQ C., DEGREZ G.

A block structured based method for the flow prediction over low Reynolds numbers multi-element airfoils, In "AIAA Conference Proceedings: 20<sup>th</sup> Congress of the International Council of the Aeronautical Sciences, AIAA, 1996, ISBN 978-1-56-347219-0

DEGREZ G.

Implicit time-dependent methods for inviscid and viscous compressible flows, In “Computational Fluid Dynamics, An introduction”, edited by John F. Wendt, Springer-Verlag, Berlin, first edition, 1992, pp. 180-222, second edition, 1996, pp. 180-229, ISBN 978-3-54-059471-0

DECONINCK H. & DEGREZ G.

Monotone shock capturing cell vertex schemes for the Euler and Navier-Stokes equations on unstructured grids, In “Proceedings of the 15th International Conference on Numerical Methods in Fluid Dynamics”, edited by P. Kutler, J. Flores, J.-J. Chattot, Springer, 1996, Lecture notes in physics, vol. 490, ISBN 3-540-63054-6

VAN DER WEIDE A., DEGREZ G., DECONINCK H.

A conservative linearization for positive residual distribution schemes on hybrid grids, In “Proceedings of the 15th International Conference on Numerical Methods in Fluid Dynamics”, edited by P. Kutler, J. Flores, J.-J. Chattot, Springer, 1996, Lecture notes in physics, vol. 490, ISBN 3-540-63054-6

GOOSSENS S., ISSMAN E., DEGREZ G., ROOSE D.

Block ILP-1U(0) preconditioning for a GMRES based Euler/Navier-Stokes solver, In “Proceedings of the International Conference on High-Performance Computing and Networking (HPCN Europe, 1996)”, edited by H. Liddell, A. Colbrook, B. Hertzberger, P. Sloot, Springer Verlag. June 1996, ISBN 3-540-61142-8

ISSMAN E. & DEGREZ G.

A parallel implicit compressible multidimensional upwind Euler/Navier-Stokes solver on unstructured meshes, In “Proceedings of the International Conference on High-Performance Computing and Networking (HPCN Europe, 1996)”, edited by H. Liddell, A. Colbrook, B. Hertzberger, P. Sloot, Springer Verlag. June 1996, ISBN 3-540-61142-8

PAILLERE H., CARETTE J.-C., ISSMAN E., VAN DER WEIDE E., DECONINCK H., DEGREZ G.

Implicit multidimensional upwind residual distribution schemes on adaptive meshes, In AGARD CP 578 on “Progress and Challenges in CFD Methods and Algorithms”, NATO, 1996, ISBN 92-836-0026-6

VAN DER WEIDE E., ISSMAN E., DECONINCK H., DEGREZ G.

A parallel implicit multidimensional upwind cell vertex Navier-Stokes solver for hypersonic applications, In AGARD R 813 “AGARD-FDP-VKI Special Course Aerothermodynamics and Propulsion Integration for Hypersonic Vehicles”, NATO, April 1996, ISBN 92-836-1041-5

DEGREZ G. & ISSMAN E.

Solving steady compressible flow problems with subspace iteration methods, In “ICIAM/ GAMM 95: contributed lectures and poster presentations of the 3rd International Congress on Industrial and Applied Mathematics”, edited by E. Kreuzer, O. Mahrenholtz. 1995, ISBN 3-055-01749-8



F. WILQUEM & G. DEGREZ

Numerical simulation of Steady inspiratory flow through a multiply branched model of the human central airways, In "ICIAM/ GAMM 95: contributed lectures and poster presentations of the 3rd International Congress on Industrial and Applied Mathematics", edited by E. Kreuzer, O. Mahrenholtz. 1995, ISBN 3-055-01749-8

DEGREZ G., GIRAUD L., LORIOT M., MICELOTTA A., NITROSSO B., STOESSEL A.  
Parallel industrial CFD calculations with N3S, In "Proceedings of the International Conference on High-Performance Computing and Networking (HPCN Europe, 1995)", Lecture Notes in Computer Science, Vol. 919, edited by L.O. Hertzberger, G. Serazzi, Springer Verlag, June 1995, ISBN 3-540-59393-4

ZEMSCH S. & DEGREZ G.

Validation of the conical flow approximation about the model of a wing/fuselage junction in high speed flow, In ESA SP 367 "Second European Symposium on Aerothermodynamics for Space Vehicles", edited by J.J. Hunt, ESA Publications Division, 1995, ISBN 92-9092-310-5

ISSMAN E. & DEGREZ G.

Implicit iterative methods for a multidimensional upwind Euler/Navier-Stokes solver on unstructured meshes, von Karman Institute Lecture Series on "Computational Fluid Dynamics", von Karman Institute LS 1995-02, 1995, ISSN 0377-8312

ISSMAN E. & DEGREZ G.

Convergence acceleration of a 2D Euler/Navier-Stokes solver by Krylov subspace methods, In "Proceedings of the 2<sup>nd</sup> European Computational Fluid Dynamics Conference", edited by S. Wagner, J. Périaux, E.H. Hirschel., Wiley, 1994, ISBN 0-471-95063-7

ISSMAN E. & DEGREZ G.

Acceleration of compressible flow solvers by Krylov subspace methods, von Karman Institute Lecture Series on "Computational Fluid Dynamics", von Karman Institute LS 1994-05, 1994, ISSN 0377-8312

ISSMAN E., DEGREZ G., DE KEYSER J.

A parallel multiblock Euler/Navier-Stokes solver on a cluster of workstations using PVM, In "Proceedings of the International Conference on High-Performance Computing and Networking (HPCN Europe, 1994)", Lecture Notes in Computer Science, Vol. 797, edited W. Gentsch, U. Harms, Springer Verlag, 1994, ISBN 3-540-57981-8

BERTUCCIOLI L. & DEGREZ G.

"Improvement and validation of an LDV system to perform measurements in laminar supersonic flows", IN AGARD CP 535 "Symposium on Wall interference, support interference and flow field measurements", AGARD, 1993, ISBN 92-835-0756-8

DEGREZ G.

Swept shock wave/laminar boundary layer interactions, experimental and numerical results, In AGARD R 792 "AGARD-FDP-VKI Special Course Shock-wave boundary-layer interactions in supersonic and hypersonic flows", NATO, May 1993, ISBN-92-835-0718-5

DEGREZ G.

A unified wall boundary condition treatment for cell-centred finite volume discretizations of the Euler and Navier-Stokes equations, In “First European Computational Fluid Dynamics Conference”, edited by J.Périaux, Ch. Hirsch, Elsevier Science, 1992, ISBN 978-0-44-489793-0

DEGREZ G. & TAHI A.

High resolution upwind solutions of the incompressible Navier-Stokes equations, In “ICAS proceedings 1990: 17<sup>th</sup> Congress of International Council of Aeronautical Sciences”, 1990, ISSN 0930403789

DEGREZ, G. & VANDROMME D.

Implicit Navier-Stokes calculations of transonic shock-turbulent boundary layer interactions, In “IUTAM Symposium on Turbulent Shear-Layer / Shock-Wave, The Proceedings of the Symposium”, edited by J. Dtlery, Springer-Verlag, Berlin, 1986

### **Course Notes**

DEGREZ, G.

Introduction to CFD, VKI Course note 153, October 1998

DEGREZ G.

Three-dimensional boundary layers and separation, VKI Course note 154, October 1998

DEGREZ G.

Inviscid compressible aerodynamics, VKI Course note 145, September 1993

DEGREZ G.

Laminar boundary layers, VKI Course note 143, October 1991