Curriculum Vitae

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My research field is computational fluid dynamics. My scientific contributions concern both the development of adaptive discretisation techniques for systems of complex non-linear partial differential equations arising in fluid mechanics modelling, and the use of these techniques to understand the limitations of such PDE models in practical applications, as well as the development ad-hoc models for some applications. The main engineering fields which so far have attracted my attention are : compressible flows for aerodynamics applications, and other applications involving similar systems of equations ; free surface flows, and in particular non-hydrostatic models allowing to reproduce the dispersion behaviour of nonlinear wave trains, as well as their interaction with complex bathymetries ; the modelling of complex composite materials, and in particular the use of CFD asymptotic modelling tools to provide numerical closure for the oxidation processes taking place in self-healing composites for the next generation of civil aeroengines.

These activities constitute the kernel of the Inria research team CARDAMOM of which I am the scientific leader. CARDAMOM stands for Certified Adaptive discRete moDels for robust simulAtions of coMplex flOws with Moving fronts. The scientific program of the team is a unique mix of numerical analysis, PDE analysis, uncertainty quantification methods, and engineering know how aiming at providing breakthroughs in coastal, energy, material, and aerospace engineering.

Contents

1   Diplomas

Ph.D.
Title : Construction and analysis of compact residual discretizations for conservation laws on unstructured meshes
Date of the defense of the Ph.D. : 21/06/2005
Granting institution : Université Libre de Bruxelles (Belgium)
Host institution : von Karman Institute for Fluid Dynamics (Belgium)

Habilitation à Diriger des Recherches (HDR)
Title : Contributions to the development of residual discretizations for hyperbolic conservation laws with application to Shallow Water flows
Date of the defense : 12/12/2011
Granting institution: Université de Bordeaux I

Post-graduate Diploma Course in Fluid Dynamics[1]
Title: Space-time residual distribution schemes and application to two-phase flow computations on unstructured meshes
Date of the defense : June 2001
Granting institution : von Karman Institute for Fluid Dynamics (Belgium)
Honors and distinction: Graduated with honors and awarded the Theodore von Karman Prize

Laurea in Ingegneria Meccanica
Title : Simulazione di Flussi Bifase per Applicazioni Macchinistiche Mediante Uso di un Modello a Due Fluidi con Metodi di Distribuzione del Residuo
Date of the defense : September 2000
Granting Institution : Università degli Studi della Basilicata (Italy)
Host institution : von Karman Institute for Fluid Dynamics (Belgium)
Honors and distinction : Summa Cum Laude

2   Professionnal history

Current professionnal status

Since October 2007 I am a Chargé de Recherche de Première Classe (CR1)[2] at Inria.
As of January 2015 I am the scientific leader of the Inria team `CARDAMOM`.

Previous professionnal experiences

Start	End	Institutions	Positions and status
01/10/2005	30/09/2007	Inria Bordeaux - Sud-Ouest	CR2
21/06/2005	30/09/2005	von Karman Institute	Post-Doctoral researcher
01/09/2001	20/06/2005	von Karman Institute	Doctoral researcher

Number of years of professional research experience after thesis: 10

3   Prizes and awards

- June 2001 : Theodore von Karman prize. Granted by the faculty of the von Karman Institute to the best Diploma Course student of the academic year

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[1]A one year postgraduate programme with a 55-years tradition. Approximately thirty-five young engineers different countries attend this program including specialized courses of fluid dynamics and a personal research project under guidance by members of the institute. `www.vki.ac.be/index.php/component/content/article/249-news/latest/440-research-master-call-for-applications`
[2]Class 1 Junior research scientist

- July 2004: Best Student Paper Award at ICCFD (International Conference on Computational Fluid Dynamics). ICCFD is the one of the largest international conferences on CFD, outcome of the merging of ICNMFD and ISCFD, where most of the major advances in CFD have been presented and discussed

- PES INRIA (2009-2012). Prime Excellence Scientifique, a National Scientific Excellence Award granted over 4 years by Inria (after a national selective competition) to research scientists with the highest levels of scientific production and service to the community.

- PES INRIA (2013-2016). Prime Excellence Scientifique, a National Scientific Excellence Award granted over 4 years by Inria (after a national selective competition) to research scientists with the highest levels of scientific production and service to the community.

4 Contribution to my scientific environnement

Contribution to the international community

- Member of the editorial board of Computers & Fluids (since January 2015: 20 manuscripts with final disposition plus 6 with a decision leading to revision) ;

- Co-organiser of the "Tsunami school 2016"[3] result of the synergy between the PIA TANDEM project (cf. section 6.2) and of the researchers of the MathOcean initiative, recently funded under the CNRS call DEFIS LITTORAL (cf. table 2.4). The aim is to share the know how available within these communities with young researchers/students aiming at a career in tsunamis-related fields. The program covers all aspects, from theoretical ones to real life cases, including talks by staff of the French alert system ;

- Co-founder and co-organizer of the workshop on wave breaking B'WAVES[4]. The first event has benefitted from the funding of the local excellence cluster CPU[5], and involving contributions by world leaders on the study of the physics of wave breaking. The second edition of the workshop, B'WAVES2016 (see http://www.uib.no/en/bwaves2016), will take place in Bergen (Norway) next June. I am co-organizing the event with Prof. H. Kalisch, and provided co-funding (from the CPU cluster of excellence, cf. table 2.4). World leaders on the study of wave breaking physics will be again presenting ;

- Co-organizer of the workshop on the hydrodynamics which will be held at BCAM (Bilbao), in the week 26-30 September 2016. The aim this workshop is to provide a state of the art in the industrial and academic modelling and simulation tools for the hydrodynamics of Wave Energy Converters. Co-organizing institutes are Inria and BCAM, in collaboration with the SME TECNALIA;

- Conference organising committees :
  - 2nd ECCOMAS Young Investigators Conference (YIC 2013) ;
  - European Workshop on High Order Nonlinear Numerical Methods (HONOM 2013) ;
  - 40th National Congress on Numerical Analysis, (CANUM 2010) ;

- Conference programme committees (sessions and mini symposia organization) :
  - "Hydrodynamics Modelling of Wave Energy Converters" (2nd Int. Conf. "Frontiers of Computational Physics: Energy Sciences" - Zurich, 2015) ;
  - "Robust and multi scale models for wave propagation" (2015 SIAM Conference on Mathematical & Computational Issues in the Geosciences, Stanford, 2015) ;
  - "Non-hydrostatic wave propagation with depth averaged equations : models and methods" (18th European Conference on Mathematics for Industry - Taormina, Italy, 2014) ;

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[3]https://project.inria.fr/tsunamischool2016/
[4]http://bwaves.bordeaux.inria.fr
[5]http://cpu.labex.u-bordeaux.fr/en/

- "Non-hydrostatic wave models" (1st Int. Conf. "Frontiers of Computational Physics: Modelling the Earth System" - Boulder, CO, 2012) ;

- Co-organizer of the 34th VKI CFD Lecture Series on higher order discretization methods, (see lecture notes VKI LS 2006-01, ISBN 2-930389-63-X, H.Deconinck and M.Ricchiuto Eds.).

- Reviewer for the most influential journals in my scientific community (J.Comput. Phys., J.Sci.Comp., Computer&Fluids, AIAA J., Int.J.Num.Meth.Fl.) ;

Contribution to the national and local community

- As of January 1st 2015 I am scientific leader of the team CARDAMOM ;

- As of 2016, I am in the steering committee "Industrial CFD" of the Aristote Association. Aristote is a non-profit organization created in 1984 by INRIA, CEA, EDF and CNES (siege at CEA Saclay) aiming at identifying the path to the simulation techniques of the future by bringing together the main players of the field of numerical simulation, active in the public or private sectors of higher education, R&D and innovation. My committee is organizing on October 2016 the day-workshop "CFD Reality - Verification & Validation"[6], with contributors from the major French industrial actors (Dassault, Renault, CEA, EDF, Safran, Airbus, etc.) ;

- I have been part of the steering committee working on the scientific guidelines for the next EDF-Inria Framework Agreement. The committee has worked between 2013 and 2015 to make an inventory of existing and possible joint activities, and provide a systematic classification according to scientific domain and applications. I have been Inria's national referent for the theme 'Numerical Analysis" ;

- In January to December 2014 I have been the scientific leader of the team BACCHUS[6] ;

- From January 2012 to December 2014 I have been "Responsable permanent" of the team BACCHUS[6] ;

- From November 2014 until fall 2015, I have lead of the committee *English @ Work*. This instance has been set up to evaluate short term solutions to help non-french speakers arriving at the Inria BSO research center (accommodation, bank account, language classes, etc), and to coordinate actions with the institute's partners (e.g. the applied mathematics and computers science departments) ;

- From January 2012 to December 2014 I have been a member of the CDT commission of the Inria Bordeaux - Sud-Ouest. The CDT ("Commission des Dévloppements Technologiques") is an instance depending on the CP ("Comitdes Projets", committee of leaders of scientific teams and administrative services of the center) which deals with the software developments and experimentations (ADTs and PFEs) and implied human resources. In particular, the CDT acts as advisory committee for the center's director concerning applications for funds to hire research and development engineers ;

- From January 2012 to December 2014 I member of the CUMI-R commission of the Inria Bordeaux - Sud-Ouest. The CUMI-R ("Commission Utilisateurs Moyens Informatiques Recherche") is an instance allowing a feedback to the local and national IT services from the researchers of the Inria center in Bordeaux ;

- I have been part of the PhD committees:

  Reviewer. L. Kolozar, U. Libre de Bruxelles, July 2011; J. Dobes, Czech Techical U., November 2008;

  External examiner. S. Pavan, Université de Paris Est, Ferbuary 2016; A. Krust, U. Bordeaux I, October 2012; R. Huart, U. Bordeaux I, February 2012; A. Frohely, U. Bordeaux I, September 2012 ; P.E. Normand, U. Bordeaux I, December 2011; C. Werwaecke, U. Bordeaux I, December 2010 ;

  Co-supervisor (official or informal). G. Perrot, U. Bordeaux, December 2015; S. D'Angelo, U. Libre de Bruxelles, March 2015; D. Genet, U. Bordeaux, December 2014; D. DeSantis, U. Bordeaux I, December 2013; A. Larat, U. Bordeaux I, November 2009; N. Villedieu, U. Libre de Bruxelles, December 2009.

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[6]see http://www.association-aristote.fr/doku.php/cpg:accueil, Cycle des Séminaires 2016

5   Management of the research

Research teams

- As of January 2015 I am the scientific leader of the team CARDAMOM. This project inherits know how from two teams which stopped in 2014: BACCHUS and MC2. The birth of CARDAMOM has involved both a fundamental reflection on the scientific themes of the project, and a transformation in manpower (recruitment of a permanent researcher to strengthen the wave modelling side, addition of a new member from the PDE team of the math department to strengthen the know how in asymptotic analysis, integration of a previous external member bringing know how in rarefied and high temperature gas modelling, departure of a computer scientist previously contributing work on graph decomposition for parallel re-meshing). The team currently counts 7 permanent members, and more than 15 non-permanent (PhDs, post-docs, R&D engineers, interns etc.). I have set a new and common course which allows to harmonize the skills of these 7 scientists in an ambitious scientific project. I have provided my tem members with canvas for both a short, and a long scientific proposal in which the main objectives, methodological choices, application fields, software production and related valorization strategy are spelled out. I have collected and harmonized their inputs, as well as taken care of implementing in the both documents the reports of internal (national) reviewers. *The full text of the team proposal is currently in the final external review phase.*

  Besides, since the inception of the team I am responsible for the animation of both scientific and administrative aspects: representing the team in several internal and external instances, timely dissemination and discussion of information primarily sent to the leader (funding opportunities, competitive selections and promotions, conference and meetings organization, etc), sharing of scientific results via bi-weekly talks, animation of discussions leading to new internal synergies, organization of budgeting and planning meetings, coordination of conference papers submissions and conference trips, etc), as well as the management of all of the human resources and administrative aspects (time sheets for EU contracts, validation of trip expenses, validation of days off demands, activity report, validation of research reports, etc.) ;

- From January 1st 2014 to December 2014 I acted as scientific leader of the team BACCHUS. Besides the duties that this role entails (extensively spelled out in the bullet point above), I have had to lead and manage the scientific, economic, and relational re-organisation of the team after the departure of his previous leader ;

- From January 2012 to December 2014 "Responsable permanent" for BACCHUS. This role entails acting as a substitute for the leader whenever necessary, participating actively to several aspects of the organization, and sharing some of the administrative duties (in my case the coordination of the contributions to the activity report, and to the team's final report for the evaluation of March 2013).

Funded research programs

As a member of the doctoral program of the von Karman Institute I contributed to several research programs : ASTAR (EU 5th EURATOM) on numerical schemes for the thermo-hydraulics of nuclear reactors ; DESINER (EU Brite-Euram) on finite element modeling of flows in chemical reactors ; SPECTRUM (EU Growth) on finite element models for two-phase flows in chemical reactors. These contributions have been given in the form of actual implementation of numerical models, student supervision, and participation to contract meetings.

While my full funding record since my arrival at Inria is summarised in table 1, the three projects most representative of the evolution and of the multidisciplinary character of my research are the following :

- FP6 ADIGMA.
  Consortium : major EU aeronautic industries (AIRBUS, DASSAULT, ALENIA, EADS) and 16 other partners including SMEs and research institutes. Objective : demonstrate the capabilities of novel higher-order numerical schemes to replace the available methods for the next generation of aerodynamics codes. Relevance for my career : crowning of my activity on high order schemes at the von Karman Institute (at a time in which this was my main research activity), and opportunity to work with the European elite in my field on a topic of high relevance both scientific and industrial. Contribution : preliminary meetings before the writing of the proposal, contributions to the proposal itself, to the activities of several work packages, and active participation to the meeting as, often, the main Inria representative. The local (Inria) grant obtained is 165k, which have funded the PhD of A. Larat whom I co-supervised. Aftermath : the follow-up contract IDIHOM has given us the chance to refine the numerical methods we develop, and bring them to a level of maturity close to actual industrial applications ;

- PIA TANDEM (`http://www-tandem.cea.fr`).
  Consortium : BRGM, CEA, EDF, Ifremer, Inria, IRSN, UPPA, Principia, Ecole des Ponts ParisTech, SHOM. Objective : TANDEM is one of the first "Projets d'Investissement d'Avenir" funded in the call "Recherche en matière de Sûreté Nucléaire et Radioprotection" and aims at improving existing Tsunami simulation tools, evaluate them on data of the Tohoku event of 2011, and provide predictions of the effects of Tsunami impact on the French Atlantic coast. Relevance for my career : crowning of my scientific efforts in the accurate and robust modelling of free surface hydrodynamics. It gives me the means of measuring my results with institutes representing the elite in the field, in France, and not only. It seals my success in this additional new scientific challenge which has become the major component of my research. Contribution : I am Inria's main representative and coordinator, I have given major contributions to the writing of the proposal, and give major contributions to several work packages. The 210k obtained will fund a PhD under my supervision. Aftermath : TANDEM's kick-off meeting had been held on February 7th 2014 at the CEA DAM center, and has an official duration of 4 years ;

- EU OceaneraNET MIDWEST (`https://project.inria.fr/midwest/`).
  Consortium : Inria (coordinator), Chalmers University (Sweden), DTU Compute (Denmark), IST Lisbon (Portugal). Objective : Wave energy converters design currently relies on linear hydrodynamics, as fully nonlinear Navier-Stokes simulations are prohibitively expensive. MIDWEST will provide computationally affordable asymptotic (Boussinesq) nonlinear finite element models, as a basis for a modern, efficient, optimization platform blending linear and nonlinear models of different complexity. Relevance for my career : Another turning point in my career. This project allows to combine my new experience in wave modelling with my valuable experience on unstructured mesh techniques and use them to tackle an important scientific and technical challenge in renewable energies. It allows me to work with (and coordinate) some of the European most active groups in the field, as well as some well known SMEs (WaveDragon, Waves4Power, Tecnalia) which constitute the steering committee of the project. Contribution : I am the project coordinator, I am by far the main architect and contributor to the project's proposal, I will provide main scientific contributions, especially in the formulation and discretization of the Boussinesq models proposed in the project, I will co-supervise the PhD hired with the 150k obtained for my research group, and I will and am already dealing with the management activities required by the coordination of the project (meeting organization, web page, reporting templates, etc). Aftermath : MIDWEST's kick-off meeting had been held on December 18th 2016 at Inria BSO, and the project an official duration of 3 years

Contract name	Funding scheme	Subject and goal	Partners (besides Inria)	Funding for my team	Contribution
ADIGMA (2006-2010)	EU FP6	Numerical methods for the next generation aerodynamics codes	AIRBUS, ALENIA, DASSAULT, EADS + 16 research inst.	165k	Proposal, PhD supervision, several WPs
CADMO (2008-2012)	Region Aquitaine	Modeling of defect tolerant composite materials	Bordeaux labs : IMS, I2M, IMB, LCTS, IPREM, ICMCB	45k	Proposal, post-doc supervision, model development
CIFRE (2009-2012)	ANRT	Implementation of high order methods in N3SNaTur	SNECMA	82k + PhD salary	Proposal, PhD supervision, methods development
IDIHOM (2011-2014)	EU FP7	Industrialization of higher order schemes for aerodynamics	DASSAULT, EADS, + 19 research inst.	180k	Proposal, PhD supervision, several WPs
PEPS UB1 (2013-2014)	UB1	Advanced numerical models for surface wave propagation	Bordeaux labs : EPOC, IMB	18k	Proposal, model development
TIDES (2014-2017)	Region Aquitaine + CordiS Inria	Finite elements for non hydrostatic wave propagation	Bordeaux lab : EPOC	110k (55k CRA + 55k CordiS)	Proposal (as PI), PhD supervision
TANDEM (2014-2018)	PIA RSNR	Evaluate Tsunami effects on French Atlantic coasts	CEA, SHOM, EDF BRGM, Ifremer, UPPA, Principia IRSN	210k	Proposal, Inria coordinator PhD supervision several WPs
B'WAVES 2014	Excellence Cluster CPU	Workshop on wave breaking		30k	Proposal, workshop organization
B'WAVES 2016	Excellence Cluster CPU	Workshop on wave breaking		7k	Proposal, workshop co-organization
MIDWEST	EU OceaneraNET	Depth averaged models for WECs	DTU Compute, Chalmers University, IST Lisbon	150k	Coordinator PhD supervision, several WPs
SURF++	ADT	Optimization of a C++ FEM library and application to free surface flows		≈100k (2 years R&D engineer)	co-PI, engineer co-supervision, coordinate platform development with UHAINA project
UHAINA	Excellence Cluster CPU	A modern operational model for the for simulations of free surface flows	UMR EPOC, CNRS, IMB,	≈50k (1 year R&D engineer)	co-PI, engineer co-supervision, coordinate platform developments with SURF++ project
BGS IT&E consulting	German SME BGS IT&E	Explicit and implicit unstructured grid schemes for flood simulations		20k	Transfer of my reserach results
VISCAP	National Research Agency	Modelling of self-healing composited	LCTS Bordeaux, LAMA Savoie	150k	Proposal revision

Table 1: Funding record (top block : before 2015; middle-block: 2015-2016; lower-block: under review)

6   Teaching and supervision of research activities

Teaching in International schools

- I will lecture at the international ASTARTE, PEARL & TANDEM Joint Summer School[7] taking place on June 3-7 2016 at the Technical University of Crete. The school is open undergraduate, graduate students, early career scientists and/or professionals with different backgrounds, who work in the fields of coastal hazards. I will cover some of the mathematical aspects of numerical simulations of free surface flows ;

- I will lecture at the joint "TANDEM-Defis Littoral Tsunami school", which will take place in Bordeaux in April 2016 and which I co-organize[8]. The school targets very young researchers, and students aiming at a career in fields related to the study of tsunamis. My lectures are devoted to the (different possible) definition(s) of the accuracy of a numerical method when considering wave propagation, in relation with the model used, and with which impact on the choices to make for a code ;

- Lecturer in the class 2014/2015 of the von Karman Institute for Fluid Dynamics post-graduate master. In particular, l have been responsible for the module "Computational Methods for Compressible Flows". The module has covered some basic aspects of the discretisation of compressible flow equations (finite volume and element methods), plus an individual project ;

- Invited lecturer at the winter school "BoND, Nonlinear dispersive wave propagation" held in February 2014 at Les Houches[9]. My lectures have been devoted to the numerical approximation of wave models, with a particular attention to dispersive phenomena. The audience targeted was young researchers and PhDs.

- Invited lecturer at the summer school CEMRACS2012 at Cirm[10]. My lectures have been devoted to the basics of residual based schemes. The audience targeted was young researchers and PhDs ;

Course	Academic years I contributed to	ETD hours per year	Level	School
Fundamentals of numerical analysis	06/07, 07/08, 08/09 11/12, 12/13, 13/14	24h (TD)	undergraduate	IPB
Numerical analysis for industry	10/11	26h (TD)	undergraduate	IPB
Numerical fluid dynamics	12/13, 13/14	16h (TD)	undergraduate	IPB
Introduction to numerical fluid dynamics	06/07, 07/08, 09/10 10/11, 11/12, 12/13, 13/14	18h (course)	postgraduate	ENSAM
Computational complexity	10/11	32h (course)	undergraduate	UB1
Fluid dynamics	15/16	30h (TD)	undergraduate	IPB

Table 2: Teaching in French universities (last block: 2016 teaching)

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[7]http://www.astarte-project.eu/index.php/summer-school-2016-copy.html

[8]https://project.inria.fr/tsunamischool2016/

[9]http://math.univ-lyon1.fr/∼benzoni/BoND.html#Houches

[10]http://smai.emath.fr/cemracs/cemracs12/

Teaching in French universities.
I have taught for a total of 390 hours ETD[11], of which 264 hours at the undergraduate level, and 126 hours in a postgraduate master (cf. table 2 for an overview). I intervened as teacher at the Institut Polytechnique de Bordeaux (IPB, MATMECA school), and at the Ecole Nationale des Arts et Métiers (ENSAM), and at the Université de Bordeaux I (UB1). The classes taught involve fundamental and applied numerical analysis, numerical methods for fluid mechanics, and computational complexity. My contributions at the postgraduate level have been given so far within the postgraduate master IAS (Ingenierie Aéronautique et Spatiale) of the ENSAM school. From 2006 to 2014, I have taught and been the main responsible for the module "Introduction to basic and recent developments in computational fluid dynamics for engineers".

Supervision of research

Post-doctoral research projects

- Sebastien DEBRYE. Post-doc co-funded by the cluster of excellence CPU in Bordeaux and Inria and started in December 2014. S. DEBRYE is developing a non-hydrostatic multi-layer finite element model for wave propagation and inundation over large geographic areas. The project also involve the study of efficient parallel solution techniques for the non-linear algebraic equations associated to these models, which will be performed in collaboration with A. Guermouche and P. Ramet of the HIEPACS Inria Team ;

- Virginie DREAN (50% co-supervision with G. Vignoles, Université de Bordeaux). Post-doc funded by the GIS MATERIAUX AQUITAINE during the December 2010-December 2011. In collaboration with the LCTS Lab (Thermo-Structural Composites Lab[12]), Virginie developed the first version of a Fortran library for the simulation of oxidation processes in composite materials crack (`SH-COMP` (cf. sec 2), Form 7). She is currently working as research engineer at EFECTIS.

Name	University (Country)	Defense date (defense type)	Current position	Co-supervision (co-supervisor)
Cedric Tavé	UB1 (France)	December 2007 (final, public)	R&D engineer EDF	50% co-supervision (R. Abgrall)
Adam Larat	UB1 (France)	November 2009 (final, public)	Research scientist CNRS	50% co-supervision (R. Abgrall)
Nadege Villedieu	ULB (Belgium)	December 2009 (final, public)	R&D Engineer AABAM (Toulouse)	20% co-supervision (H. Deconinck)
Guillaume Baurin	UB1 (France)	Undefended (permanent job)	R&D engineer EDF (since 2012)	50% co-supervision (R. Abgrall)
Dante De Santis	UB1 (France)	December 2013 (final, public)	Post-doc Stanford	20% co-supervision (R. Abgrall)
Andrzej Warzynzki	ULeeds (UK)	December 2013 (final, private)	R&D engineer Cambridge Consultants Ltd	20% co-supervision (M.E. Hubbard)
Damien Genet	UB1 (France)	December 2014 (final, public)	Post-doc University of Tenessee	20% co-supervision (F. Pellegrini, A. Guermouche)
Stefano D'Angelo	ULB (Belgium)	February 2015	Consulting engineer at CREDO (BE)	50% co-supervision (H. Deconinck)
Gregory Perrot	UB (France)	December 2015		50% co-supervision (G. Vignoles)

Table 3: Past PhDs (UB : U. de Bordeaux , ULB : U. Libre de Bruxelles, ULeeds : U. of Leeds).

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[11] "Equivalent Travaux Dirigés", unit for one hour of exercises on/applications of theoretical aspects taught in the main course
[12] http://www.lcts.u-bordeaux1.fr

Ongoing PhD theses:

- Umberto BOSI (started December 2015, 66% co-supervision with C. Eskilsson of Chalmers University, and A.-P. Engsig-Karup of DTU Compute). Hired on the funds of the MIDWEST project (see section 6.2), Umberto Bosi will contribute to the development of a spectral finite element platform coupling two nonlinear depth averaged flow models, for a free surface region and for the flow below a floating body, with the force balance for the body itself. The aim is the optimization of a point extractor wave energy converter ;

- Leo NOUVEAU (33% co-supervision with H. Beaugendre and C. Dobrzinsky, `CARDAMOM`). PhD funded by a EU-FP7[13] project on de-anti icing systems. The objective of the thesis is to develop efficient adaptive tools for the simulation of wing icing. I supervise the development of ALE unstructured grid methods for penalized Navier-Stokes equations. The PhD defense is foreseen for September 2016 ;

- Luca ARPAIA (started April 2014, 80% co-supervision with P. Bonneton, UMR EPOC Bordeaux). Hired on the funds of the PIA project TANDEM (see section 6.2), Luca Arpaia woks on enhancing hydrostatic shallow water codes with an adaptive mesh movement, and on the coupling with uncertainty propagation to perform parametric studies of bore propagation (tidal and Tsunami) in complex estuarine bathymetries ;

- Stevan BELLEC (started October 2013, 50% co-supervision with M. Colin, Bordeaux INP). S. Bellec works on the optimization of asymptotic PDEs arising in depth averaged modelling of free surface waves, and of the obtention of fully discrete asymptotic models starting from discretizations of the 3D Euler equations ;

- Andrea FILIPPINI (started October 2013, 80% co-supervision with P. Bonneton, UMR EPOC Bordeaux). Co-funding Inria-Aquitaine region (TIDES project). A. Filippini works on the development of adaptive stabilized finite element approximations for fully nonlinear depth averaged free surface wave models ;

For completeness, a summary of past PhD projects is given in table 3.

R&D Engineers

- S. Delmas (33% co-supervision with P. Bonneton (UMR EPOC), D. Lannes (CNRS and IMB)). Objective: construction of a modern platform for the simulation of free surface flows (co-developments with N. Pattakos, cf. section 7.2) and form 7 section 2)). Period : 1 year, contract started January 2016 ;

- N. Pattakos (33% co-supervision with H. Mathieu from `SED` Inria BSO, and V. Perrier of the CAGIRE Inria Team). Objective: packaging and optimization of the C++ finite element library for fluid mechanics `AeroSol`, contributing to the construction of a modern platform for free surface flow simulations (cf. section 7.2) and form 7 section 2)). Period : 2 years, contract started March 2015 ;

- D. Amenga-Mbengoue (50% co-supervision with R.Abgrall). Objective: implementation of residual distribution schemes in the C++ finite element library `AeroSol` ; Period : 2011-2012. Current position : after a contract as R&D engineer in Inria team `CARMEN`, currently in professional retraining (Master in Hydraulics at INP-ENSEEIHT Tolouse) ;

- G. Perrot (50% co-supervision with G. Vignoles, UMR LCTS). Objective: improvement and maintenance of a Fortran platform for the simulation of the oxidation process in self-healing composites. Period : 03/2011-09/2011. Current position : defended his PhD (see table 2.1) on December 17th 2015.

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[13]http://www.fp7-storm.eu

VKI Diploma Course research projects

During my stay at the von Karman Institute I have co-supervised with H. Deconinck several Diploma Course research projects. A summary is reported on table 4

Name	Project title	Class	Current position
Jiri Dobes	Implicit space-time method for laminar viscous flow	2001-2002	Consultant at Skoda Power
Dante Rubino	A two-phase flow solver based on two-fluid models and conservative upwind residual distribution schemes	2001-2002	R&D engineer at General Electric
Michele Giordano	Finite element based solver for two-phase flow	2002-2003	CEO of SME (Solethenia)
Thomas Nierhaus	Model refinement and implementation of PSPG/SUPG-stabilized finite element algorithm for incompressible two-phase flow	2003-2004	
Nadege Villedieu	Study of a 3rd order residual distributive scheme for advection diffusion equations	2003-2004	Post-Doc at CERFACS

Table 4: Co-supervision (with H. Deconinck) of VKI diploma course projects

Undergraduate research projects

A summary of my master's thesis supervision is reported in table 6 and **??** (last year's projets), indicating their subsequent enrolment in research programs, and if under my supervision or not.

Name	Host	Subject	Year	Continued
B. DE MAERSCHALCK	VKI	Residual based schemes for time dependent problems	2002	Yes
J. WITTEVEEN	VKI	Two-phase flow simulations using tabulated equations of state	2003	Yes
N. VILLEDIEU	VKI	Residual based schemes for advection-diffusion	2003	Yes (my supervision)
M. CHOJNACKI	VKI	Two-phase flow simulations with Eulerian models in Fluent	2003	
T. NIERHAUS	VKI	Implicit time integration for incompressible flows	2003	Yes (my supervision)
G. GAUDIUSO	VKI	ALE formulation for explicit upwind finite volume schemes	2004	Yes
L. AZZOLINI	VKI	Residual based schemes for incompressible two-phase flows	2004	
P. SKUZA	VKI	Low-Reynolds turbulence modeling	2004	
D. ESCOBAR ANTON	VKI	Third order residual scheme for steady advection diffusion	2004	Yes
L. TOSSATO	VKI	Advection reaction and fluctuation schemes	2004	Yes

Table 5: Undergraduate research projects : Name, host, subject, year, and further research activity (my supervision if mentioned).

Name	Host	Subject	Year	Continued
A. BOLLERMANN	IMB	Shallow water simulation on unstructured grids	2006	Yes
J. KLOSA	Inria	Residual based schemes with extrapolated BDf time integration	2012	Yes
L. ARPAIA	Inria	Residual based schemes in ALE formulation	2012	Yes (my supervision)
A. FILIPPINI	Inria	Non-hydrostatic wave modeling	2013	Yes (my supervision)
P. BACIGALUPPI	Inria	Finite element modeling of wave breaking and runup	2013	Yes
C. BONED	Inria	Coupling of asymptotic oxidation model with FEM model of a self-healing composite	2015	
P. QUEMAR	Inria	Time dependent shock-fitting techniques	2015	Yes
U. BOSI	Inria	Wave energy converters Boussinesq modelling	2015	Yes (my supervision)
J. STEINSTRAESSER	Inria	ALE based mesh adaptation	2015	Yes

Table 6: Undergraduate research projects : Name, host, subject, year, and further research activity (my supervision if mentioned). Lower-block: last year's projects

7 Selected publications[14]

1.2) International journals

[1] P. Bonneton, A. Filippini, L. Arpaia, N. Bonneton and M. Ricchiuto. Conditions for tidal bore formation in convergent alluvial estuaries. *Estuarine, Coastal and Shelf Science*, 2016. In press. doi:10.1016/j.ecss.2016.01.019.

[2] A. Filippini, M. Kazolea and M. Ricchiuto. A flexible genuinely nonlinear approach for wave propagation, breaking and runup. *J.Comput.Phys*, 310:381–417, 2016.

[3] L. Nouveau, H. Beaugendre, C. Dobrzynski, R. Abgrall and M. Ricchiuto. An adaptive, residual based, splitting approach for the penalized navier stokes equations. *Computer Methods in Applied Mechanics and Engineering*, 2016. doi:http://dx.doi.org/10.1016/j.cma.2016.01.009.

[4] L. Arpaia, M. Ricchiuto and R. Abgrall. An ALE formulation for explicit Runge-Kutta residual distribution. *Journal of Scientific Computing*, 63:502–547, 2015.

[5] J. Dobes, M. Ricchiuto, R. Abgrall and H. Deconinck. On hybrid residual distribution-Galerkin disretizations for steady and time dependent viscous laminar flows. *Computer Methods in Applied Mechanics and Engineering*, 283:1336–1356, 2015.

[6] A. Filippini, S. Bellec, M. Colin and M. Ricchiuto. On the nonlinear behavior of Boussinesq type models: amplitude-velocity vs amplitude-flux forms. *Coastal Engineering*, 99:109–123, 2015.

[7] M. Ricchiuto. An explicit residual based approach for shallow water flows. *Journal of Computational Physics*, 280:306–344, 2015.

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[14]Refer to my web site for a full list of publications and full-text documents

[8] A. Warzynski, M. Hubbard and M. Ricchiuto. Runge-Kutta residual distribution schemes. *Journal of Scientific Computing*, 62(3):772–802, 2015.

[9] R. Abgrall, D. deSantis and M. Ricchiuto. High-order preserving residual distribution schemes for advection-diffusion scalar problems on arbitrary grids. *SISC - SIAM Journal of Scientific Computing*, 36(3):A955–A983, 2014. *(Applied Math.)*.

[10] M. Ricchiuto and A. Filippini. Upwind residual discretization of enhanced Boussinesq equations for wave propagation over complex bathymetries. *Journal of Computational Physics*, 271:306–341, 2014.

[11] R. Abgrall, G. Baurin, D. DeSantis, A. Krutz and M. Ricchiuto. Numerical approximation of parabolic problems by residual distribution schemes. *International Journal of Numerical Methods in Fluids*, 71(9), 2013. *(Applied Math.)*.

[12] D. Sarmany, M. Hubbard and M. Ricchiuto. Unconditionally stable space-time discontinuous residual distribution for shallow water flows. *Journal of Computational Physics*, 253:86–113, 2013.

[13] R. Abgrall, G. Baurin, P. Jacq and M. Ricchiuto. Some examples of high order parallel simulations of inviscid flows on unstructured and hybrid meshes by residual distribution schemes. *Computers & Fluids*, 61:6–13, 2012. *(Applied Math.)*.

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[15] M. Hubbard and M. Ricchiuto. Discontinuous upwind residual distribution: A route to unconditional positivity and high order accuracy. *Computers & Fluids*, 46(1):263 – 269, 2011.

[16] M. Ricchiuto. On the C-property and generalized C-property of residual distribution for the shallow water equations. *Journal of Scientific Computing*, 48:304–318, 2011.

[17] N. Villedieu, T. Quintino, M. Ricchiuto and H. Deconinck. Third order residual distribution schemes for the Navier-Stokes equations. *Journal of Computational Physics*, 230(11):4301 – 4315, 2011.

[18] M. Ricchiuto and R. Abgrall. Explicit Runge-Kutta residual distribution schemes for time dependent problems: Second order case. *Journal of Computational Physics*, 229(16):5653 – 5691, 2010. *(Applied Math.)*.

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[22] M. Ricchiuto, R. Abgrall and H. Deconinck. Application of conservative residual distribution schemes to the solution of the shallow water equations on unstructured meshes,. *Journal of Computational Physics*, 222:287–331, 2007.

[23] J. Dobes, M. Ricchiuto and H. Deconinck. Implicit space-time residual distribution method for unsteady laminar viscous flow. *Computers & Fluids*, 34(4-5):593 – 615, 2005.

[24] M. Ricchiuto, A. Csík and H. Deconinck. Residual distribution for general time dependent conservation laws. *Journal of Computational Physics*, 209(1):249–289, 2005.

[25] H. Staedtke, G. Franchello, B. Worth, U. Graf, P. Romstedt, A. Kumbaro, J. Garcia-Cascales, H. Paillére, H. Deconinck, M. Ricchiuto, B. Smith, F. D. Cachard, E. Toro, E. Romenski and S. Mimouni. Advanced three-dimensional two-phase flow simulation tools for application to reactor safety (ASTAR). *Nuclear Engineering and Design*, 235(2-4):379 – 400, 2005.

[26] A. Csík, M. Ricchiuto and H. Deconinck. A conservative formulation of the multidimensional upwind residual distribution schemes for general nonlinear conservation laws. *Journal of Computational Physics*, 179(2):286–312, 2002.

1.3) Reviewed international conferences (book of proceedings or full article review)

[27] M. Kazolea and M. Ricchiuto. Wave breaking and dissipation in weakly and fully non-linear Boussinesq models. In *Proc. of the 35th International Conference on Ocean Engineering*. Istanbul, Turkey, July 2016. (accepted).

[28] A. Mazaheri, M. Ricchiuto and H. Nishikawa. Hyperbolic Method for Dispersive PDEs: Same High-Order of Accuracy for Solution, Gradient, and Hessian. In *Proc. of the AIAA Aviation and Aeronautics Forum and Exposition*. Washington D.C., June 2016. (accepted).

[29] D. Violeau, R. Ata, M. Benoit, A. Joly, S. Abadie, L. Clous, M. M. Medina, D. Morichon, J. Chicheportiche, V. Hergault, M. L. Gal, , A. Frère, A. Gailler, H. Hébert, D. Imbert, A. Loevenbruck, M. Kazolea, M. Ricchiuto, A. Lemoine, S. L. Roy, R. Pedreros, K. Pons, R. Marcer and R. S. Jacinto. A database of validation cases for tsunami numerical modelling. In *Proc. of the 4th International Association for Hydro-Environnement Engineering and Research (IAHR) European conference*. Liege, Belgium, July 2016. (accepted).

[30] L. Arpaia, A. Filippini, P. Bonneton and M. Ricchiuto. Modelling analysis of tidal bore formation in convergent estuaries. In *36th International Association for Hydro-Environnement Engineering and Research (IAHR) World Conference*. The Hague, Netherlands, June 2015.

[31] C. Eskilsson, J. Palm, A. Engsig-Karup, U. Bosi and M. Ricchiuto. Wave Induced Motions of Point-Absorbers: a Hierarchical Investigation of Hydrodynamic Models. In *11th European Wave and Tidal Energy Conference (EWTEC)*. Nantes, France, September 2015.

[32] A. Filippini, S. Bellec, M. Colin and M. Ricchiuto. Conservative and non-conservative variants of weakly nonlinear Boussinesq models: derivation and numerical assessment. In G. Russo, editor, *ECMI2014, 18th European conference on Mathematics for Industry*, Springer Proceedings Mathematics in Industry. Springer Heidelberg, 2015.

[33] R. Abgrall, L. Arpaia and M. Ricchiuto. An ale formulation for explicit runge-kutta residual distribution. In J. Fuhrmann, M. Ohlberger and C. Rohde, editors, *Finite Volumes for Complex Applications VII*, volume 77 of *Springer Proceedings in Mathematics and Statistics*. Springer, 2014.

[34] P. Bacigaluppi, M. Ricchiuto and P. Bonneton. A 1d stabilized finite element model for non-hydrostatic wave breaking and run-up. In J. Fuhrmann, M. Ohlberger and C. Rohde, editors, *Finite Volumes for Complex Applications VII*, volume 77 of *Springer Proceedings in Mathematics and Statistics*. Springer, 2014.

[35] G. Perrot, V. Drean, G. Couegnat, M. Ricchiuto and G. Vignoles. New numerical methods for the modelling of oxide formation in self-healing cmcs. In *HT-CMC8 - 8th International Conference on High-Temperature Ceramic Matrix Composites*. Xi'An, China, September 2014.

[36] P. Ramsamy, P. Poullet and M. Ricchiuto. An accurate and efficient wave propagation finite-volume solver to simulate a sediment transport phenomenon. *Proceedings - 2014 International Conference on Electromagnetics in Advanced Applications, ICEAA 2014*, pages 769–771, 2014.

[37] D. Amenga-Mbengoue, D. Genet, C. Lachat, E. Martin, M. Mogé, V. Perrier, F. Renac, F. Rue and M. Ricchiuto. Comparison of algorithm in AeroSol and Aghora for compressible flows. *ESAIM : Proceedings*, 43:1–16, 2013.

[38] V. Drean, G. Perrot, G. Couegnat, M. Ricchiuto and G. Vignoles. Image-based 2d numerical modeling of oxide formation in self-healing CMCs. In W. Kriven, A. Gyekenyesi, G. Westin and J. Wang, editors, *Developments in Strategic Materials and Computational Design III*, volume 33, pages 117–125. John Wiley & Sons, Inc., 2013. ISBN 9781118217542.

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[42] M. Ricchiuto. Explicit residual discretizations for shallow water flows. *AIP Conf.Proc*, 1389(1), 2011.

[43] C.Y.Kuo, B.Nkonga, M. Ricchiuto, Y.-C.Tai and B.Bracconnier. Dry granular flows with erosion/deposition process. *ESAIM : Proceedings*, 28:135–149, 2009.

[44] A. Larat, R. Abgrall and M. Ricchiuto. Very high order residual distribution schemes for steady flow problems. In H. Choi, H. G. Choi and J. Yoo, editors, *Computational Fluid Dynamics 2008*, pages 269–274. Springer Berlin Heidelberg, 2009. ISBN 978-3-642-01272-3. doi:10.1007/978-3-642-01273-0_32.

[45] M. Ricchiuto and R. Abgrall. Stable and convergent residual distribution for time-dependent conservation laws. In H. Deconinck and E. Dick, editors, *Computational Fluid Dynamics 2006*, pages 89–94. Springer Berlin Heidelberg, 2009. ISBN 978-3-540-92778-5. doi:10.1007/978-3-540-92779-2_11.

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[48] R. Abgrall, M. Ricchiuto, N. Villedieu, C. Tavé and H. Deconinck. Very high order residual distribution on triangular grids. In *ECCOMAS CFD 2006, European Conference on Computational Fluid Dynamics*. The Netherlands, September 2006.

[49] B. Braconnier, B. Nkonga, M. Papin, P. Ramet, M. Ricchiuto, J. Roman and R. Abgrall. Efficient solution technique for low mach number compressible multiphase flow. In *ECCOMAS CFD 2006, European Conference on Computational Fluid Dynamics*. The Netherlands, September 2006.

[50] M. Ricchiuto, A. Csik and H. Deconinck. Conservative residual distribution schemes for general unsteady systems of conservation laws. In C. Groth and D. W. Zing, editors, *Computational Fluid Dynamics 2004*, pages 219–224. Springer Berlin Heidelberg, 2006. ISBN 978-3-540-31800-2. doi:10.1007/3-540-31801-1_28.

[51] J. Dobeš, M. Ricchiuto and H. Deconinck. Implicit space-time residual distribution method for unsteady viscous flow, June 2003. *16th AIAA Computational Fluid Dynamics Conference*, Orlando, Florida, USA.

[52] H. Paillere, J. Garcia-Cascales, A. Kumbaro, D. Bestion, S. Mimouni, H. Stadtke, G. Franchello, B. Worth, U. Graf, P. Romsted, E. Toro, E. Romensky, H. Deconinck, M. Ricchiuto, F. DeCachard and B. Smith. Advanced three dimensional two-phase flow simulation tool for application to reactor safety (astar). In *FISA-2003/EU Research in reactor safety*. Luxembourg, November 2003.

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1.4) Books and book chapters

[56] S. D'Angelo, M. Ricchiuto and H. Deconinck. Adjoint-based error estimation for adaptive Petrov-Galerkin nite element methods. In *Adjoint methods and their application in Computational Fluid Dynamics*, 38th Lecture Series on Advanced Computational Fluid Dynamics. von Karman Institute for Fluid Dynamics, Belgium, 2015.

[57] M. Vymazal, L. Koloszar, S. D'Angelo, N. Villedieu, M. Ricchiuto and H. Deconinck. High-order residual distribution and error estimation for steady and unsteady compressible flow. In N. Kroll, C. Hirsch, F. Bassi, C. Johnston and K. Hillewaert, editors, *IDIHOM: Industrialization of High-Order Methods - A Top-Down Approach*, volume 128 of *Notes on Numerical Fluid Mechanics and Multidisciplinary Design*, pages 381–395. Springer International Publishing, 2015. doi:10.1007/978-3-319-12886-3_17.

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[59] R. Abgrall, R. Butel, P. Jacq, C. Lachat, X. Lacoste, A. Larat and M. Ricchiuto. Implicit strategy and parallelization of a high order residual distribution scheme. In N. Kroll, H. Bieler, H. Deconinck, V. Couaillier, H. van der Ven and K. Sorensen, editors, *ADIGMA - A European Initiative on the Development of Adaptive Higher-Order Variational Methods for Aerospace Applications*, volume 113 of *Notes on Numerical Fluid Mechanics and Multidisciplinary Design*, pages 209–224. Springer Berlin / Heidelberg, 2010.

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[61] R. Abgrall, A. Larat and M. Ricchiuto. Construction of high order residual distribution schemes. In M. Hafez, K. Oshima and D. Kwak, editors, *Computational Fluid Dynamics Review 2010*. Worls Scientific, 2010. ISBN 978-981-4313-36-0.

[62] R. Abgrall, A. Larat and M. Ricchiuto. Construction of high order residual distribution schemes. *VKI LS 2008-08, 35th Computational Fluid dynamics/ADIGMA Course on very high order discretization methods, von Karman Institute for Fluid Dynamics*, 2008.

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[67] H. Deconinck, M. Ricchiuto and K. Sermeus. Introduction to residual distribution schemes and stabilized finite elements. *VKI LS 2003-05, 33rd Computational Fluid dynamics Course, von Karman Institute for Fluid Dynamics*, 2003.

[68] J. Dobeš, M. Ricchiuto and H. Deconinck. Implicit space-time residual distribution method for unsteady laminar viscous flow. *VKI LS 2003-05, 33rd Computational Fluid dynamics Course, von Karman Institute for Fluid Dynamics*, 2003.

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1.5) Other publications (selected conferences with abstract/short paper review, posters, other. . .)

[71] M. Ricchiuto *et al.* CARDAMOM: Certified Adaptive discRete moDels for robust simulAtions of coMplex flOws with Moving fronts, 2016. Scientific proposal, `http://www.math.u-bordeaux1.fr/%7Emricchiu/cardamom-proposal.pdf` .

[72] L. Arpaia and M. Ricchiuto. Well Balanced ALE: on time dependent adaptation for shallow water flows. In *GAMM 86th Annual Scientific Conference, Mar 2015, Lecce, Italy*, GAMM 86th Annual Scientific Conference, Mar 2015, Lecce, Italy. Lecce, Italy, 2015. (Abstract review).

[73] H. Beaugendre, L. Nouveau, C. Dobrzynski, R. Abgrall and M. Ricchiuto. Unsteady residual distribution schemes adapted to immersed boundary methods on unstructured grids to account for moving bodies. In *13th US National Congress on Computational Mechanics*. San Diego (CA), 2015. (Abstract review).

[74] C. Eskilsson, A. Engsig-Karup and M. Ricchiuto. Spectral element modelling of floating bodies in a Boussinesq framework. In *2nd Frontiers in Computational Physics Conference: Energy Sciences*. Zurich, Switzerland, June 2015. (Abstract review).

[75] L. Nouveau, H. Beaugendre, M. Ricchiuto, R. Abgrall, C. Dobrzynski and A. Froehly. Mesh adaptation by local remeshing and application to immersed boundary methods in fluid mechanics. Workshop DIP TOTAL/INRIA. In *Workshop DIP INRIA/TOTAL*. Pau, France, June 2015.

[76] M. Ricchiuto. Certified Adaptive discRete moDels for robust simulAtions of coMplex flOws with Moving fronts, January 2015. CP talk, `http://www.math.u-bordeaux1.fr/%7Emricchiu/CP-08_01_2015.pdf`.

[77] M. Ricchiuto and L. Arpaia. Simple and conservative mesh adaptation for shallow water flows. In *Recent Developments in the Numerics of Nonlinear Hyperbolic Conservation Laws*. Oberwolfach, Germany, September 2015. (Invited Talk), password protected pdf on my web page (preprints). user: `m76` - pwd: `talk_download1`.

[78] M. Ricchiuto *et al.* `CARDAMOM`: Certified Adaptive discRete moDels for robust simulAtions of coMplex flOws with Moving fronts. Short proposal, 2015. `http://www.math.u-bordeaux1.fr/%7Emricchiu/cardamom.pdf` .

[79] L. Arpaia and M. Ricchiuto. Well-balanced ALE: a framework for time dependent mesh adaptation for the shallow water equations. In *SIAM Conf. on Nonlinear Waves and Coherent Structures*. Cambridge, UK, August 2014. (Abstract review).

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[81] P. Congedo, A. Delis and M. Ricchiuto. Robust code-to-code comparison for long wave run up. In *SIAM Conf. on Mathematical and Computational Issues in the Geosciences*. Padova, Italy, June 2013. (Abstract review).

[82] G. Perrot, V. Drean, G. Couegnat, M. Ricchiuto and G. Vignoles. Modèlisation 2d de la formation d'oxyde dans les CMCs à matrice auto-cicatrisante. In *CFM2013 - Congres Francais de Mecanique 2013*. Bordeaux, France, August 2013. (Abstract review).

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1.6) Research reports (selected) and publications under review

[84] R. Abgrall and M. Ricchiuto. High order methods for CFD. *Encyclopedia of Computational Mechanics*, 2016. Invited contribution, to appear.

[85] L. Arpaia, A. Filippini, P. Bonneton and M. Ricchiuto. Modelling analysis of tidal bore formation in convergent estuaries. *Ocean Modelling*, 2016. Under review.

[86] S. Bellec, M. Colin and M. Ricchiuto. Discrete asymptotic equations for long wave propagation. *SIAM Journal on Numerical Analysis*, 2016. Under review, (see INRIA RR8806).

[87] S. D'Angelo, M. Ricchiuto, H. Deconinck and R. Abgrall. Adjoint-based error estimation for adaptive Petrov-Galerkin finite element methods - Part I. *Computer Methods in Applied Mechanics and Engineering*, 2016. Under review.

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[89] A. Mazaheri, M. Ricchiuto and H. Nishikawa. A first-order hyperbolic system approach for dispersion. *J.Comput.Phys.*, 2016. Under review.

[90] S. Pavan, J. Hervouet, M. Ricchiuto and R. Ata. A second order residual based predictor-corrector approach for time dependent pollutant transport. *J.Comput.Phys*, 2016. Major revision.

[91] P. Roe and M. Ricchiuto. Multidimensional solvers and residual distribution schemes. *Handbook on numerical methods for hyperbolic problems. Volume II: Applied and modern issues*, 2016. Invited contribution, in preparation.

[92] L. Arpaia and M. Ricchiuto. Mesh adaptation by continuous deformation. Basics: accuracy, efficiency, well balancedness. Research Report RR-8666, Inria Bordeaux Sud-Ouest ; INRIA, January 2015.

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