
CURRICULUM VITAE

OF

Eric Didier

Contents

1. PERSONAL DETAILS	4
2. ACADEMIC DEGREES	5
3. POSITION HELD AND PROFESSIONAL ACTIVITIES	5
3.1. PREVIOUS ACTIVITIES AND CURRENT STATUS	5
3.2. POS-DOCTORAL STUDIES AT LNEC: NUMERICAL MODELLING OF WAVE-STRUCTURE INTERACTION USING THE SPH MODEL	6
3.3. POS-DOCTORAL STUDIES AT FCT-UNL: NUMERICAL AND EXPERIMENTAL MODELLING OF FLUCTUATING FLOW PAST BLUFF BODIES	6
3.4. POS-DOCTORAL STUDIES AT FCT-UNL: PROPAGATION OF WAVE GROUPS AND LONG WAVES AT THE COAST.....	7
3.5. PHD STUDIES AT ECOLE CENTRAL DE NANTES: FREE SURFACE FLOW SIMULATION USING UNSTRUCTURED MESHES	7
4. RESEARCH INTERESTS	7
5. AREA OF SCIENTIFIC ACTIVITY	8
5.1. HYDRODYNAMICS: NUMERICAL MODELLING OF FREE SURFACE FLOWS	8
5.2. PHYSICAL MODELLING.....	8
5.3. AERODYNAMICS, EXTERNAL FLOW: AERODYNAMIC FORCES ON STRUCTURES, FLUID STRUCTURE- INTERACTION.....	9
5.4. HEATING, VENTILATION AND AIR CONDITIONING - HVAC: NUMERICAL MODELLING OF VENTILATION SYSTEM OF PROJECT	9
5.5. COMPUTATIONAL FLUID DYNAMICS - CFD: DEVELOPMENT OF SOLUTIONS IN NUMERICAL MODELLING	9
6. AREA OF ACTUAL INVESTIGATION	10
7. PARTICIPATION IN RESEARCH PROJECTS	10
8. PROPOSITION OF RESEARCH PROJECTS	13
9. PARTICIPATION IN ENGINEERING PROJECTS	14
10. MEMBER OF RESEARCH GROUPS	17
11. OTHER PROFESSIONAL ACTIVITIES	18
12. REVIEWING OF CONFERENCE AND JOURNAL PAPERS	18
13. PARTICIPATION IN CONFERENCE ORGANISATION	19
14. PARTICIPATION IN JURY OF MASTER THESIS	20
15. GUIDANCE OF STUDENTS AND TEACHING ACTIVITY	21
15.1. GUIDANCE OF FELLOWSHIP.....	21
15.2. MASTER THESIS OF UNDERGRADUATE STUDENT IN FLUID MECHANICS/HYDRODYNAMIC	21
15.3. TEACHING AND GUIDANCE OF FINAL YEAR PROJECT OF UNDERGRADUATE STUDENT.....	23
15.4. SCIENTIFIC FORMATION AND INITIATION OF RESEARCH	25

16. LANGUAGES.....	26
17. CONFERENCES AND WORKSHOPS ATTENDED (PAPER PRESENTED).....	27
17.1. NATIONAL CONFERENCES	27
17.2. INTERNATIONAL CONFERENCES	28
18. CONFERENCES, WORKSHOPS, FORUMS AND COURSES ATTENDED	29
19. PUBLICATIONS.....	30
19.1. THESES	30
19.2. PAPERS IN SCIENTIFIC PERIODICALS.....	31
19.3. PAPERS IN INTERNATIONAL CONFERENCE PROCEEDINGS	33
19.3. PAPERS IN NATIONAL CONFERENCE PROCEEDINGS.....	39
19.4. BOOKS	43
19.5. ORAL COMMUNICATIONS.....	44
19.6. PUBLICATIONS IN NEWSLETTER	44

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2. Academic Degrees

- PhD in “**Mécanique des Fluides et des Transferts**”, Ecole Centrale de Nantes, University of Nantes, France, 2001. This degree was recorded at the *Universidade Nova de Lisboa* with the n° 08/2010 on 5 May 2010 in accordance with the Article 4° of Decree-Law N° 341/2007 of October 12.
- Master in “**Mécanique des Fluides et des Transferts**”, Ecole Centrale de Nantes, University of Nantes, France, 1997.
- Master in “**Mécanique des Milieux Géophysiques et Environnement**”, University Joseph Fourier, Grenoble, France, 1993.
- Degree of “**Maîtrise de Mécanique**”, University Joseph Fourier, Grenoble, France, 1991-1992.
- Degree of “**Licence de Mécanique**”, University Joseph Fourier, Grenoble, France, 1990-1991.
- Degree of “**DEUG de Sciences de la Matière**”, University Joseph Fourier, Grenoble, France, 1988-1990.

3. Position Held and Professional Activities

3.1. Previous Activities and Current Status

- Since 2007 – Research Grant Holder for Post-Doctoral studies undertaken at National Civil Engineering Laboratory - **LNEC**, Hydraulics and Environment Department, at Harbours and Maritime Structures Division - NPE, Lisbon, Portugal. Project: *Numerical modelling of wave-structure interaction using the SPH model*.
- Since 2007 – Professor (invited) at Faculty of Science and Technology of New University of Lisbon - **FCT-UNL**, at the Department of Mechanical and Industrial Engineering - DEMI, Monte de Caparica, Portugal.
- 2006 – Investigator at the **Wave Energy Centre** (WavEC), in the Professor António Sarmiento team, Lisbon, Portugal.
- 2005 - 2007 – Consultant Heating, Ventilation and Air Conditioning - HVAC, in collaboration with society France-Air, Lda, Lisbon, Portugal.
- 2005 - 2007 – Collaborator at Faculty of Science and Technology of New University of Lisbon - **FCT-UNL**, at the Department of Mechanical and Industrial Engineering - DEMI, Monte de Caparica, Portugal.
- 2002 - 2005 – Research Grant Holder for Post-Doctoral studies undertaken at Faculty of Science and Technology of New University of Lisbon - **FCT-UNL**,

at the Department of Mechanical and Industrial Engineering - DEMI, Lisbon, Portugal. Project: *Numerical and experimental modelling of fluctuating flow past bluff bodies*.

- 2001 - 2002 – Research Grant Holder for Post-Doctoral studies undertaken at National Civil Engineering Laboratory - LNEC, Hydraulics and Environment Department, at Harbours and Maritime Structures Division - NPE - and at Faculty of Science and Technology of New University of Lisbon - FCT-UNL, at the Department of Mechanical and Industrial Engineering - DEMI, Lisbon, Portugal. Project: *Propagation of wave groups and long waves at the coast*.
- 1997 - 2001 – PhD student at **Ecole Centrale de Nantes**, Fluid Mechanic Laboratory, University of Nantes, France.
- 1996 -1997 – Master student at **Ecole Centrale de Nantes**, Fluid Mechanic Laboratory, University of Nantes, France.
- 1992 -1993 – Master student at **CEMAGREF** de Grenoble, University Joseph Fourier, France.

3.2. Pos-Doctoral studies at LNEC: Numerical modelling of wave-structure interaction using the SPH model

The main objective of the proposed project, *Numerical modelling of wave-structure interaction using the SPH model*, SFRH/BPD/37901/2007, is to develop numerical tools for supporting the design of maritime structures using the Smoothed Particle Hydrodynamics (SPH) approach that allows the study of most of the phenomena involved in wave-structure interaction. The main objectives of this proposal are: i) to contribute to the development of the numerical model SPHysics; ii) to analyse and validate the SPH model through the comparison of predictions with available numerical or experimental data: barred beach, impermeable breakwater, overtopping; iii) to develop new tools to improve the performance and extend the applicability of the SPH model to practical engineering applications; iv) to have a significant contribution to the advance of science, technology, and engineering through improvement of numerical models and development of guidelines for using the SPH model; v) to have a participation in the SPH European Research Interest Community (SPHERIC) and to become (Portugal) a member of this research group. The work is being developed in collaboration with Dr. Maria da Graça Neves at the National Civil Engineering Laboratory (LNEC), Hydraulics and Environment Department, Harbours and Maritime Structures Division.

3.3. Pos-Doctoral studies at FCT-UNL: Numerical and experimental modelling of fluctuating flow past bluff bodies

The main objectives of the proposed project, *Numerical and experimental modelling of fluctuating flow past bluff bodies*, SFRH/BPD/8302/2002, are: i) to develop a numerical code, based on finite volume method, for modelling uniform and fluctuating flow past a circular cylinder; ii) to develop a fully coupled resolution method to solve Navier-Stokes equations, solving only one linear system. Thus momentum equations and continuity equation, in its original form, are solved simultaneously, without reconstruction of pressure equation; iii) to develop the numerical model for structured

and unstructured meshes; iv) to validate the numerical program for uniform flow at low Reynolds numbers; v) to apply the numerical program to fluctuating flow past a cylinder; vi) to analyze flow interference for two cylinder in tandem arrangement. The final result is the development of the two-dimensional program FullCREM. The work was developed in collaboration with Professor António R. Janeiro Borges in the New University of Lisbon, Faculty of Science and technology, Department of Mechanical and Industrial Engineering.

3.4. Pos-Doctoral studies at FCT-UNL: Propagation of wave groups and long waves at the coast

The main objectives of the proposed Pos-Doctoral project, *Propagation of wave groups and long waves at the coast*, included in the research project PDCTM/P/MAR/15239/1999, are: i) to contribute to the development of a numerical model based on the fully nonlinear Euler equations, solved using a Boundary Element Method - BEM; ii) to apply the program for wave propagation on the variable bathymetry of the Ria Formosa (Portugal); iii) to analyze the wave transformation along the wave propagation, the energy balance between fundamental and harmonic frequencies and identified long waves at the coast. The work was developed in collaboration with Professor Luis Miguel da Costa Gil at the New University of Lisbon, Faculty of Science and technology, Department of Mechanical and Industrial Engineering, and in collaboration with Dr. João Santos at the National Civil Engineering Laboratory (LNEC), Hydraulics and Environment Department, Harbours and Maritime Structures Division.

3.5. PhD studies at Ecole Central de Nantes: Free surface flow simulation using unstructured meshes

The thesis for the degree of PhD was entitled "Free surface flow simulation using unstructured meshes" (Simulation d'écoulements à surface libre sur des maillages déstructurés) and it concentrated mainly on the development of a numerical program for modelling free surface flows. Navier-Stokes equations are discretized using a finite volume method and solved using a fully coupled resolution method: discrete velocity equations and reconstructed pressure equation are solved simultaneously. Free surface flow is simulated using a Volume of Fluid - VoF - technique based on capturing free surface method. The developed program, Ulysses, allows simulating complex free surface flows like dam-break and breaking waves. The work was developed in collaboration with Dr. Bertrand Alessandrini and Dr. Gerard Delhommeau at the Ecole Centrale de Nantes, Fluid Mechanic Laboratory.

4. Research Interests

- Computational Fluid Dynamics – CFD: Numerical modelling of fluid flow; Development of solutions and numerical modelling programs; Applications in engineering projects and scientific investigations.

- Wave and wave-structure interaction: Wave propagation and transformation in coastal areas, interaction between waves and coastal structures, overtopping and impact loads on breakwaters.
- Wave energy: Oscillating Water Column – OWC, among others techniques of wave energy converters.
- Lagrangian methods: Smoothed Particle Hydrodynamics – SPH – model development and application for coastal engineering, wave-structure interaction and overtopping.
- Aerodynamics: External flows, flows around cylinder and cylinders in various arrangements, wake flow control past cylinder, complex flows with separation.

5. Area of Scientific Activity

5.1. Hydrodynamics: Numerical modelling of free surface flows

- Marine: Ships and offshore platforms.
- Wave energy converters: offshore and onshore Oscillating Water Column - OWC – systems.
- Coastal structures: wave-structure interaction, wave breaking in coastal areas, wave overtopping of coastal structures and impact loads
- Waves: wave propagation and transformation in coastal areas (shallow and intermediate water waves).
- Fluid-Structure Interaction
- Numerical modelling of wave propagation and transformation, wave breaking and wave overtopping of coastal structures, interaction between waves and structures using FLUENT program, Boussinesq model (like COULWAVE or FUNWAVE), fully non-linear boundary element method program (CANAL) and Smoothed Particle Hydrodynamics method – SPH.

5.2. Physical modelling

- Physical modelling in wave flume of interaction between wave and coastal structure, wave breaking in coastal areas, wave overtopping of coastal structures and impact loads on vertical breakwater.
- Physical modelling in water tank of submerged pipe of circular section for studying pressure and forces on the pipe.

5.3. Aerodynamics, external flow: aerodynamic forces on structures, fluid structure-interaction

- Vortex-Induced-Vibration of circular cylinder.
- Flow around circular cylinder and cylinders, flow interference between circular cylinders.
- Study of flow and aerodynamic coefficients of bridge section, among other structures.
- Numerical modelling using FLUENT commercial program and in-house fully coupled resolution method program FullCReM.

5.4. Heating, Ventilation and Air Conditioning - HVAC: Numerical modelling of ventilation system of project

- Ventilation and smoke control of underground and closed car parks.
- Comfort in closed spaces, hospital rooms, apartments and atrium.
- Quality of air, efficiency of ventilation and comfort in operating theatres.
- Numerical modelling using FLUENT program.

5.5. Computational Fluid Dynamics - CFD: Development of solutions in numerical modelling

- Program for modelling free surface flows using a Volume of Fluid – VOF – technique and a fully coupling resolution method of the Navier-Stokes equations (with reconstruction of a pressure equation): Ulysses Program.
- Development of a fully coupling resolution method in velocity and pressure to model unsteady incompressible flows around circular cylinders: FullCReM program. The method consists to simultaneously solved momentum equations and the continuity equation in its original form.
- Development of a Smoothed Particle Hydrodynamics – SPH – numerical model for modelling interaction between waves and coastal structures, wave overtopping and forces on structures: SPH_CoastEng program.
- Contribution to development a program based on Euler equations, solved using a Boundary Element Method – BEM, for modelling wave propagation and transformation in coastal areas: CANAL program.
- FLUENT program used for engineering applications and investigations.
- Development of mesh programs to construct unstructured meshes, based on Delaunay triangulation, O-type meshes, etc.

6. Area of Actual Investigation

- Development of Smoothed Particle Hydrodynamics – SPH numerical model: Mesh-less method to study wave-structure interaction, overtopping of impermeable and porous coastal structures.
- Coastal engineering: Analysis of wave-structure interaction, viability and efficiency of structures, wave overtopping and wave propagation.
- Development of coupling methods between wave propagation model and Smoothed Particle Hydrodynamics model.
- Numerical modelling of on-shore and near-shore wave energy converters: Analysis of amplification factor in waves amplitude, resonance, and pneumatic power.
- Flow around circular cylinders: study of wake control and aerodynamic forces on a cylinder using small control cylinders, simulation of flow past cylinders using Large Eddy Simulation.
- Fluid-Structure interaction (Hydrodynamic and aerodynamic)

7. Participation in Research Projects

- DITOWEC – Development of an Integrated Tool for numerical modelling of oscillating water column wave converters integrated in vertical breakwaters, 2013. Project PTDC/ECM-HID/1719/2012, funded by Fundação da Faculdade de Ciências e Tecnologia – FFCT / FCT / UNL in collaboration with National Civil Engineering Laboratory - LNEC. Member of team. The project proposes to develop an innovative Integrated Tool for numerical modelling of wave propagation from offshore to the coast and wave/structure interaction, simulating the complex nonlinear aerodynamic and hydrodynamic phenomena that occur in an OWC-WEC. This Integrated Tool will directly allow the simulation of the prototype structure, at prototype scale, with real bathymetry and offshore wave climate, eliminating any problem related to scale effects that may occur in physical modelling. Duration: Two years, from 1/7/2013 to 30/6/2015.
- Experimental study of forces on a submarine outfall: influence of incident wave direction, of stabilizing concrete weights and pipe distance from the bottom, 7th EC FRAMEWORK PROGRAMME INTEGRATING ACTIVITY: HYDRALAB IV, 2013. Research proposal in the context of Transnational Access to Hydralab Major Research Infrastructure – Research proposal for access to the shallow water basin of DHI Water & environment, coordinated by Maria Graça Neves, National Civil Engineering Laboratory - LNEC, in collaboration with University of Granada e WW-Consult. Member of team. The project consists to study, through physical modelling in wave-tank, the influence

of incident wave direction, of stabilizing concrete weights and pipe distance from the bottom. Duration: 6 weeks, from XXX to XXX. One week at DHI.

- Project Coming of Visiting Researcher (*Vinda de Pesquisador Visitante*) founded by CNPq (Brazil), 2012. Collaboration for teaching, supervision and investigation between Universidade Federal de Rio Grande - FURG (RS - Brazil) and National Civil Engineering Laboratory - LNEC, in collaboration with Prof. Paulo R.F. Teixeira of Department of Ocean Engineering at FURG. Duration: From 5 to 19 November, 2012:
 - Participation in V SEMENGO congress with presentation of a paper about SPH numerical method applied to coastal engineering “Modelação de um quebra-mar de talude impermeável: Comparação entre modelo numérico SPH e modelo físico” and participation in a paper about flow past oscillating cylinder “Análise numérica da interacção entre escoamentos a baixos números de Reynolds e cilindros apoiados em base elástica”.
 - Determination of actual and future collaborations and investigations in Computational Fluid Dynamics development applied to wave energy, flow past oscillating cylinders and vortex induced vibrations, and coastal engineering.
 - Elaboration of an abstract for submission at international conference SCACR 2013, about coupling technique between a numerical model of wave propagation, Fluinco, and a numerical model of wave-coastal structure interaction, SPH developed at LNEC.
- SPACE – A Smoothed Particle Hydrodynamic model development and validation for Coastal Engineering applications, 2010. Project PTDC/ECM/114109/2009, funded by FCT-MCTES, coordinated by National Civil Engineering Laboratory - LNEC, in collaboration with University of Algarve - Ualg. **Principal Investigator of team.** The project has two main areas: the numerical modelling and the data acquisition. Smoothed Particles Hydrodynamics - SPH - numerical model will be improved and used to performed applications of wave-coastal structure interactions (prototype and physical model scale). Validation and application of the model will be performed using different kind of data: small scale from physical model tests available at LNEC and performed in flume and prototype scale data from field measurements will be undertaken within this project. Duration: three years from 1/1/2011 to 31/12/2013.
- Project *Rede de cooperação de Pesquisa sobre Hidrodinâmica Costeira de Aguas Rasas, Amigos de Boussinesq*. Construction of a group of research and knowledge in coastal engineering. International cooperation between Portugal and Brazil, CAPES-FCT - 2008-2010. Member of team.
 - Institutions in Portugal: LNEC - National Civil Engineering Laboratory, and FCT-UNL - Faculty of Science and Technology of New University of Lisbon.

- Institutions in Brazil: UNIFEI - Federal University of Itajubá, UNESP - Universidade Estadual Paulista, UFRGS - Federal University of Rio Grande do Sul, UFRJ - Federal University of Rio de Janeiro, and UFRN - Federal University of Rio Grande do Norte.
- Mission in Brazil from 11 March to 5 May.
 - Universidade Federal de Rio Grande - FURG, 12 - 20 March (Contact: Prof. Paulo Teixeira).
 - Universidade Estadual Paulista - UNESP, 21 - 3 April (Contact: Prof. Geraldo Maciel).
- BRISA – Breaking waves interaction with sand transport. Project PTDC/ECM/67411/2006, funded by FCT-MCTES, coordinated by National Civil Engineering Laboratory - LNEC, in collaboration with University of Algarve - Ualg, and University of Aveiro - UA. Member of team. The project contributes to a better knowledge and to numerical modelling capacity of wave breaking and sediment transport processes in coastal regions. The project aims to: perform laboratory experiments for the determination of the Relative Trough Froude Number (RTFN) during and at termination of wave breaking; Establish a new wave breaking model based on the theory of the RTFN and to implement it on several numerical wave propagation models; Analyze the effects of wave nonlinearities in the sediment fluxes and sea-bed morphodynamics and to improve the numerical sediment transport models; And obtain a detailed field data set of measurements of waves and currents, and bed elevation. All this data allows validating the numerical models developed and tested during the project.
- Project *Rede de cooperação de Pesquisa sobre Hidrodinâmica Costeira de Aguas Rasas, Amigos de Boussinesq*. Construction of a group of research and knowledge in coastal engineering. International cooperation between Portugal and Brazil, CAPES- GRICE - 2006-2008. Member of team.
 - Institution in Portugal: LNEC - National Civil Engineering Laboratory, and FCT-UNL - Faculty of Science and Technology of New University of Lisbon.
 - Institution in Brazil: UNIFEI - Federal University of Itajubá, UNESP - Universidade Estadual Paulista, UFRGS - Federal University of Rio Grande do Sul, UFRJ - Federal University of Rio de Janeiro, and UFRN - Federal University of Rio Grande do Norte.
- LOCO – Propagation of wave groups and long waves at the coast. Project POCTI/MAR/15239/1999, funded by FCT-MCTES, coordinated by National Civil Engineering Laboratory - LNEC, in collaboration with Faculty of Science and Technology of New University of Lisbon - FCT-UNL, and University of Algarve Ualg. Member of team. The project allows a better understanding of: The propagation of both wave groups and long waves as well as of the generation of long waves; The availability of tested analytical models for long-wave generation; The availability of a varying-depth numerical wave flume. This will be a cheap and easy way of validating analytical models for wave propagation (with no breaking) when compared to the collection of field or

experimental data; The availability of a numerical model for trapped wave propagation along the coast; And the establishment of a coherent field data set which will be very helpful in the characterisation of the physical processes at the Portuguese coast. This data set allows also the validation of numerical models for wave-group propagation up to the shoreline.

8. Proposition of Research Projects

- Coming of Visiting Researcher (*Vinda de Pesquisador Visitante*) founded by CNPq (Brazil), 2012: Development of collaboration of teaching, guidance and investigation between Universidade Federal de Rio Grande - FURG (RS - Brazil), and National Civil Engineering Laboratory - LNEC, in collaboration with Professor Paulo R.F. Teixeira of Department of Ocean Engineering at FURG. Rio Grande – RS, Brazil, 5-19 November 2012. **Was approved.**
- DITOWEC – Development of an Integrated Tool for numerical modelling of oscillating water column wave converters integrated in vertical breakwaters, PTDC/ECM-HID/1719/2012, 2012, coordinated by Fundação da Faculdade de Ciências e Tecnologia – FFCT / FCT / UNL. Member of team. **Was approved.**
- ARPES – Risk Assessment in the project of submarine outfalls, PTDC/MAR-EST/3659/2012, 2012, coordinated by the National Civil Engineering Laboratory – LNEC. Member of team.
- Experimental investigation of forces on a submarine outfall, 2012: Influence of incident wave direction, of stabilizing concrete weights and pipe distance from the bottom: Research proposal in the context of Transnational Access to Hydralab Major Research Infrastructure – Research proposal for access to the shallow water basin of DHI Water & environment, coordinated by the National Civil Engineering Laboratory – LNEC. Member of team. **Was approved.**
- SIWEC – Non-linear Numerical Simulation of Hydrodynamics and Aerodynamics of Wave Energy Converter Integrated in Vertical Breakwaters, PTDC/ECM/121043/2010, 2010, coordinated by Fundação da Faculdade de Ciências e Tecnologia – FFCT / FCT / UNL. **Principal Investigator of team.**
- RISO - New Tools for Risk Management In Submarine outfall and Water Intake Projects, PTDC/ECM/118366/2010, 2010, coordinated by the National Civil Engineering Laboratory – LNEC. Member of team.
- Coming of Visiting Researcher (*Vinda de Pesquisador Visitante*) founded by CNPq (Brazil), 2010: Development of collaboration of teaching, guidance and investigation between Universidade Estadual Paulista - UNESP (SP - Brazil), and National Civil Engineering Laboratory - LNEC, Graduate Program – PROPG-UNESP, in collaboration with Professor Geraldo Maciel at UNESP. **Was approved.**
- SPACE - A Smoothed Particle Hydrodynamic model development and validation for Coastal Engineering applications, PTDC/ECM/114109/2009,

2009, coordinated by the National Civil Engineering Laboratory - LNEC, in collaboration with University of Algarve - Ualg. **Principal Investigator of team. Was approved.**

- MODINTER - Modelling of wave current interactions in coastal areas, PTDC/ECM/111577/2009, 2009, coordinated by Technical University of Lisbon - IST, in collaboration with the National Civil Engineering Laboratory - LNEC, and Faculty of Science and Technology of New University of Lisbon - FCT-UNL. Member of team.
- Advanced modelling nonlinear hydrodynamics of wave energy converters, PTDC/EME-MFE/116222/2009, 2009, coordinated by Technical University of Lisbon - IST, in collaboration with the Faculty of Science and Technology of New University of Lisbon - FCT-UNL. Member of team.
- PARADISE - Incorporation of Probabilistic Risk Assessment and Optimization Methods in Project Submarine Outfalls and Water Outlets, PTDC/ECM/099497/2008, 2008, coordinated by National Civil Engineering Laboratory - LNEC, in collaboration with the Technical University of Lisbon - IST, University of Aveiro - UA, and University of Granada. Member of team.
- LACE - Development of a model Lagrangian Smoothed Particle Hydrodynamic applications for coastal structures, PTDC/ECM/104382/2008, 2008, coordinated by the National Civil Engineering Laboratory - LNEC, in collaboration with University of Algarve - Ualg. **Principal Investigator of team.**
- SWECOT - Numerical simulation of linear and nonlinear dynamics of wave energy converters and platforms for offshore wind turbines, PTDC/EME-MFE/105330/2008, 2008, coordinated by Technical University of Lisbon - IST, in collaboration with the National Civil Engineering Laboratory - LNEC, and Faculty of Science and Technology of New University of Lisbon - FCT-UNL. Member of team.
- URCoast - Meet the reflection in marine structures, PTDC/MAR/65675/2006, 2006, coordinated by the National Civil Engineering Laboratory - LNEC, in collaboration with Faculty of Science and Technology of New University of Lisbon - FCT-UNL, and Engineering Faculty of University of Porto - FEUP. Member of team.
- Development and test of an X-ray velocimetry system, POCTI/EME/59110/2004, coordinated by the Faculty of Science and Technology of New University of Lisbon - FCT-UNL, in collaboration with the Technical University of Lisbon - IST. Member of team.

9. Participation in Engineering Projects

- Aerodynamic study of Rio Corgo Bridge project (South of Vila Real, Portugal)

- *Simulações complementares relativa a Ponte sobre o Rio Corgo*, CAET XXI Construções A.C.E. (Portugal), 2010: Experimental and numerical study of alternative options to reduce forces on the bridge section.
- *Aerodinâmica da Ponte sobre o Rio Corgo da Auto-estrada Transmontana: Ensaio dinâmico em modelo seccional*. CAET XXI Construções A.C.E. (Portugal), 2010: Experimental study of bridge model section in wind tunnel of the Faculty of Science and Technology. Dynamic tests are performed to define aerodynamic coefficients.
- *Simulação computacional do vento sobre o tabuleiro da Ponte sobre o Rio Corgo na Auto-Estrada Transmontana, com vista à garantia da segurança rodoviária em situação de vento forte, usando guarda-ventos*. CAET XXI – Consorcio Auto-Estrada Transmontana, Soares da costa (Portugal) e FCC (Spain), 2010: Numerical study of wind protection barriers and evaluation of barrier efficiency for various type of barriers and wind incidence.
- *Estudo numérico da influência sobre o vento da orografia da zona circundante da Ponte sobre o Rio Corgo – Auto-Estrada Transmontana*. LCW Consult, SA (Lisbon), 2009: Numerical study of wind in the local zone of the bridge construction (complex terrain due to the river Rio Corgo).
- Study of comfort (temperature and ventilation) in Atrium and Hall using Computational Fluid Dynamics – CFD, in collaboration with France-Air, Lda (Lisbon):
 - Busgate – Atrium of Lisbon airport (Portugal), 2009: CFD study of Heating, Ventilation and Air Conditioning - HVAC - system in winter and summer conditions and verification of comfort in the Atrium.
 - Hall of Astoria Hotel in Bruxelle (Belgium), 2009: CFD study of Heating, Ventilation and Air Conditioning - HVAC - system and comfort in the hall reception of the hotel.
- Computational Fluid dynamics – CFD – study of Heating, Ventilation and Air Conditioning - HVAC - system and comfort (temperature and ventilation) in hospital rooms, hotels and apartments, in collaboration with France-Air, Lda (Lisbon):
 - Comfort in hospital rooms:
 - Hospital Todos os Santos, in Algarve (Portugal), 2009.
 - Clinic Lotus, in Lisbon, (Portugal), 2006.
 - Hospital St Antonio, in Porto (Portugal), 2006.
 - Comfort in hotel rooms and apartments:
 - Hotel Viva Marinha (Portugal), 2007.
 - Quinta do Castelo Poente (Portugal), 2007.

- Cooling of Data center
 - Cooling of Data Center and ventilation system optimization
- Projects to study ventilation and smoke control in underground and closed car parks and Buildings using Computational Fluid Dynamics – CFD, in collaboration with France-Air, Lda (Lisbon):
 - Forum Alegro, Setubal – Portugal, 2013: CFD study of smoke control of car parks and optimization of ventilation system.
 - Forum Acquaville, Luanda – Angola, 2012: CFD study of smoke control of car parks and optimization of ventilation system.
 - Cidade Financeira, Luanda – Angola, 2012: CFD study of smoke control of car parks and optimization of ventilation system.
 - Forum Oeiras, 2011: CFD study of ventilation and smoke control in the 2 gallery levels of Forum Oeiras commercial center.
 - IKEA de Loures, Lisbon (Portugal), 2010: CFD study of smoke control of car parks and optimization of ventilation system.
 - Espaço Guimarães, Guimarães (Portugal), 2009: CFD study of smoke control of the car parks.
 - Norfin Complex, Lisbon (Portugal), 2008: CFD study of smoke control of car parks and optimization of ventilation system for several level of the car park.
 - IKEA do Porto, Porto (Portugal), 2007: CFD study of smoke control of the car parks.
 - Other projects of smoke control study in closed car parks using CFD:
 - Hipermercado Barreiro, Barreiro (Portugal), 2010.
 - Parque do Mineiro (Portugal), 2010.
 - Forum Sintra, Sintra (Portugal), 2010.
 - Parque Miraflores, Lisbon (Portugal), 2009.
 - IKEA Alfragide, Lisbon (Portugal), 2008.
 - Parque Campus 21 (Portugal), 2008.
 - Forum Castelo Branco, Castelo Branco (Portugal), 2008.
 - Forum Barreiro, Barreiro (Portugal) 2008.
 - Dolce Vita, Lisbon (Portugal), 2008.
 - Hospital Todos os Santos, Algarve (Portugal), 2008.
 - Forum Santa Maria de Feira (Portugal), 2007.

- Brisa (Portugal), 2007.
 - Hospital Santo Antonio, Porto (Portugal), 2006.
- Others projects of smoke control and smoke evacuation
 - Hangars Embraer, 2012: Computational Fluid Dynamics project to study the efficiency of smoke control in the hangars
- Projects to study the ventilation efficiency and comfort (temperature and velocity of air) in operating theaters and biological safety cabinets using Computational Fluid Dynamics – CFD, in collaboration with France-Air, Lda (Lisbon):
 - Biological safety cabinets – IPO/LX (Portugal), 2010.
 - Study of Laminar airflow ceiling BioVax system in operating theaters (France), 2009.
 - Operating theater at Hospital Todos os Santos, Algarve (Portugal), 2009.
 - Operating theater at Clinic Lotus, Lisbon (Portugal), 2006.
 - Operating theater at Hospital St Antonio, Porto (Portugal), 2006.
- Projects to study ventilation and smoke control in road and railway tunnels, in collaboration with France-Air Porto, Lda (Portugal).
 - Road tunnel of Águas Santas, Roadway A4 Porto-Amarante, Portugal, 2012: Computational Fluid Dynamics project to study the efficiency of smoke control system in the tunnel.
 - Railway tunnel for connecting the Cascais line with the Sete Rios Line, 2011: Computational Fluid Dynamics project to study the efficiency of smoke control system in the tunnels and in the railway station of Alcântara.
 - Benfica road tunnel, CRIL-IC17, Lisbon, 2011: Computational Fluid Dynamics project to study the efficiency of smoke control system (Final configuration).
 - Benfica road tunnel, CRIL-IC17, Lisbon, 2008: Computational Fluid Dynamics project to study the efficiency of smoke control system and its optimization.

10. Member of Research Groups

- Since 2007, Member of **SPHERIC group** - Smoothed Particles Hydrodynamics European Research Interest Community, European Special Interest Group on SPH within the ERCOFTAC community (European Research Community On flow, Turbulence And Combustion). The goal of SPHERIC group is to foster the

spread of this simulation method within Europe (& abroad). It forms a framework for closer co-operation between research groups working on the subject and serve as a platform for the information exchange from science to industry.

http://wiki.manchester.ac.uk/spheric/index.php/SPHERIC_Home_Page

- Since 2007, Member of **Investigation Centre MARETEC** - Marine Environment and Technology Centre, IST - Instituto Superior Técnico (Technical University of Lisbon), Lisbon. The general strategy followed by the group in Marine Technology has been to develop modelling capabilities in particular marine systems, wave energy systems (Oscillating Wave Column system) and wave-structure interaction.

<http://maretec.ist.utl.pt/>

- 2003-2006, Member of the Investigation Unity of Mechanical and Industrial Department of Engineering (UNIDEMI), Faculty of Science and Technology of New University of Lisbon - FCT-UNL, Lisbon.

11. Other Professional Activities

- Since 2007, Member of the Scientific Council of LNEC.
- Since 2001, Member of APMTAC (Portuguese Association of Theoretical, Applied and Computational Mechanics).

12. Reviewing of Conference and Journal Papers

- 2012, IV Conferência Nacional em Mecânica dos Fluidos, Termodinâmica e Energia, 28-29 May 2012, National Laboratory of Civil Engineering, Lisbon, Portugal.
 - *Metodologias de energia primaria aplicadas a Portugal*, Paper 11.
 - *High-performance SPH numerical modeling for mixtures of viscous fluid and granular*, Paper 25.
 - *Modelação e optimização dum sistema flutuante de conversão de energia das ondas com turbina de ar*, Paper 50.
 - *Estudo numérico do comportamento dinamico de um reservatorio hidropneumatico*, Paper 58.
 - *Simulação de roll waves em escoamentos de fluidos newtoniano e não-newtoniano*, Paper 67.

- *Simulação de escoamentos turbulentos em torno de um cilindro utilizando as aplicações Ansys Fluent e Code Saturne*, Paper 80.
 - *SPH-based numerical simulation of the velocity field in a dam-break flow*, Paper 102.
- 2011, 9th EWTEC, European Wave and tidal Energy Conference Series, 5-9 September 2011, University Southampton, UK.
 - *Navier-Stokes modelling for contra-rotating tidal turbines*, Abstract #212.
- 2010, ASME 2010 US-European Fluids Engineering Summer Meeting – FEDSM2010, 2-4 August 2010, Montreal, Canada.
 - *Numerical simulation of the flow around a circular cylinder following a figure-8-like path*, L. Baranyi, Paper FEDSM-ICNMM2010-30888.
- 2007, Journal of Computational and Applied Mechanics.
 - *Vortex cloud flow modelling of cylinders in orbital motion at low Reynolds numbers and comparisons with some published grid-based CFD predictions*, R.I. Lewis, Paper, pp149-161.
- 2006, International Conference on Modelling Fluid Flow 2006, Budapest, Hungary.
 - *Unsteady flow phenomena in the edge tone*, I. Vaik and G. Paal

13. Participation in Conference Organisation

- Member of the Scientific Comity of the Conference SEMENGO – Seminário em Engenharia Oceânica, organized at Federal University of Rio Grande, RS-Brazil, 7-9 November 2012, Rio Grande, RS-Brazil.
- Member of the Organization Comity of the conference *IV Conferência Nacional em Mecânica dos Fluidos, Termodinâmica e Energia*, MEFTE, organized at National Laboratory of Civil Engeneering, 28 and 29 May 2012, Lisbon, Portugal.
- Chairman of the session *Caracterização e Propagação da Agitação Marítima* at the conference *7as Jornadas Portuguesas de Engenharia Costeira e Portuária*, JPECP, 6 and 7 October 2011, Porto, Portugal
- Chairman of the mini-symposium *Numerical Modelling of Waves Interacting with Coastal Structures*, organized by E. Didier and M.G. Neves, at the conference ECCOMAS CFD2010, organized at National Laboratory of Civil Engeneering, 14 to 17 June 2010, Lisbon, Portugal.

- Chairman of the session *Caracterização e Propagação da Agitação Marítima* at the conference *6as Jornadas Portuguesas de Engenharia Costeira e Portuária*, JPECEP, 8 and 9 October 2009, Funchal-Madeira, Portugal.
- Member of the Organization Comity of the conference *I Conferência Nacional de Métodos Numéricos em Mecânica dos Fluidos Termodinâmica*, organized at Faculty of Science and Technology of the New University of Lisbon, 8 and 9 June 2006, Monte de Caparica, Portugal.

14. Participation in Jury of Master Thesis

- Tiago Marchão Moreira, 2012, *Contribuição para a validação do código numérico OpenFOAM em escoamentos com superfície livre* (Contribution for the validation of the OpenFOAM numerical code for free surface flows), Master of Mechanical Engineering of Faculty of Science and Technology of New University of Lisbon, Portugal.
- Tiago Miguel dos Santos Patrício, 2012, *Modelação numérica do galgamento de quebra-mares de talude* (Numerical Modelling of wave overtopping of breakwater), Master of Mechanical Engineering of Faculty of Science and Technology of New University of Lisbon, Portugal.
- Maria Sofia Charters Oliveira Reis de Mariz, 2012, *Modelação numérica do galgamento em estruturas marítimas porosas* (Numerical modelling of wave overtopping in maritime porous structures), Master of Civil Engineering of Instituto Superior Técnico, Universidade Técnica de Lisboa, Lisbon, Portugal.
- Filipe Bacalhau Guerreiro Amado, 2012, *Estudo numérico do escoamento numa chaminé como ventilador estático* (Numerical study of flow inside and outside of a cylindrical chimney), Master of Mechanical Engineering of Faculty of Science and Technology of New University of Lisbon, Portugal.
- Euclides José de Carvalho Silva Rodrigues, 2012, *Galgamento de estruturas marítimas: Comparação de ferramentas de cálculo* (Overtopping of coastal structures), Master of Civil construction of Instituto Politécnico de Setúbal, Portugal.
- João Pedro Alves Dias, 2011, *Simulação numérica do escoamento em turbinas colocadas numa falésia* (Numerical simulation of flow in turbines placed on a cliff), Master of Mechanical Engineering of Faculty of Science and Technology of New University of Lisbon, Portugal.
- André Filipe Arrais Pacheco Lopes, 2011, *Interação térmica de edifícios altos com o vento atmosférico*, Master of Mechanical Engineering of Faculty of Science and Technology of New University of Lisbon, Portugal.
- João Luís Guerreiro Aveiro, 2009, *Estudo do escoamento dos produtos da combustão no interior de uma conduta de evacuação de turbinas a gás*

utilizadas para propulsão naval, Master of Mechanical Engineering of Faculty of Science and Technology of New University of Lisbon, Portugal.

- Rui Manuel Gomez, 2009, *Estudo conceptual do desenvolvimento de uma célula de Mini-UAV*, Integrated Master of Mechanical Engineering of Faculty of Science and Technology of New University of Lisbon, Portugal.

15. Guidance of Students and Teaching activity

15.1. Guidance of fellowship

- João Dias, 2013: Integration and guidance of the fellowship in the Investigation Project SPACE, A Smoothed Particle Hydrodynamic model development and validation for Coastal Engineering applications, PTDC/ECM/114109/2009, National Laboratory of Civil Engineering – LNEC, in the Hydraulics and Environment Department – DHA, in the Harbours and Maritime Structures Division – NPE.
- Diogo Ruben Castelo Branco das Neves, 2012-2013: Integration and guidance of the fellowship in the Investigation Project SPACE, A Smoothed Particle Hydrodynamic model development and validation for Coastal Engineering applications, PTDC/ECM/114109/2009, National Laboratory of Civil Engineering – LNEC, in the Hydraulics and Environment Department – DHA, in the Harbours and Maritime Structures Division – NPE.
- Joel Roberto Guimarães Vasco, 2011: Collaboration in the co-orientation of the PhD thesis during its stage at National Laboratory of Civil Engineering – LNEC, in the Hydraulics and Environment Department – DHA, in the Harbours and Maritime Structures Division – NPE.
- Fabiana Oliveira, 2010: Collaboration in the co-orientation of the PhD thesis during its stage at the Faculdade of Ciências e Tecnologia da Universidade Nova de Lisboa, in the Department of Mechanical and Industrial Engineering – DEMI.

15.2. Master Thesis of undergraduate student in fluid mechanics/hydrodynamic

- Helson Primo Soares, 2013, *Numerical Study of overtopping of Albufeira breakwater using a SPH numerical method* (Estudo do Quebra-mar do Porto de Pesca de Albufeira: Modelação numérica do galgamento usando um método SPH), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- João Cruz Clérigo Franco Inverno, 2013, Numerical modelling of the interaction between waves and submerged pipe (Modelação numérica da interacção de ondas com emissários submarinos), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial

Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.

- André Filipe Luso Lourenço Rodrigues, 2013, *Simulation of coastal structures overtopping using a Smoothed Particle Hydrodynamic numerical model* (Modelação do galgamento de estruturas costeiras usando um modelo Smoothed Particle Hydrodynamic), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- Sérgio Manuel Ferrão de Azevedo Capela e Silva, 2012, *Numerical modelling of wave-structure interaction of submarine outfalls* (Modelação numérica da interacção onda-estrutura em emissários submarinos), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- José Luís Cordeiro Fachadas, April 2012, *Analysis of various numerical models for capturing free surface flow and application to a convertor device of CAO type* (Análise de vários modelos numéricos de captura de superfície livre e aplicação a um dispositivo conversor de energia de tipo CAO), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- José Pedro Estácio Marques Correia, March 2012, *Hydraulic and structural behavior of an isolated cylindrical caisson of circular section* (Comportamento hidráulico-estrutural de um caixotão isolado: determinação dos coeficientes de forma), student of Naval School (Almada, Portugal).
- Ricardo Manuel do Vale Martins, January 2012, *Study of regular wave interaction with a vertical breakwater using a Smoothed Particle Hydrodynamics numerical model* (Análise da interacção entre uma onda regular e um quebra-mar vertical usando um modelo numérico Smoothed Particle Hydrodynamics), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- Moises Gonçalves de Brito, 2011, *Dimensioning and optimization of pumping chambers of pipeline systems* (Dimensionamento e optimização de câmaras de bombagem de sistemas de abdução), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- Rúben dos Santos Ramalhais, 2011, *Numerical simulations of an Oscillating Water Column system* (Simulação numérica de um dispositivo de conversão de energia das ondas), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- Divyesh Mahendralal Parxotomo, 2011, *Numerical study of a passive wake control to reduce forces on a circular cylinder* (Estudo numérico de uma técnica

de redução dos esforços numa estrutura cilíndrica circular), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.

- Bruno Miguel da Silva Henriques, 2010, *Numerical simulations of smoke control in underground car parks* (Modelação numérica da desenfumagem de um parquet de estacionamento subterrâneo), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- André Assunção Sequeira, 2010, *Numerical simulation of natural ventilation* (Ventilação natural de edifícios), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.
- Tiago Garcia Barreiro, 2009, *Numerical study of interaction between monochromatic wave and OWC system* (Estudo da interação de uma onda monocromática com um conversor de energia), student of Integrated Master of Mechanical Engineering at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon.

15.3. Teaching and guidance of final year project of undergraduate student

Guidance of final year project of undergraduate students in Mechanical Engineering and training courses.

- Course:
 - Course at Universidade Federal de Rio Grande, FURG, Rio Grande, RS-Brazil: *SPH numerical method and application to coastal engineering*, 6-19 November, 2012.
 - Training course at Universidade Estadual Paulista – UNESP, Ilha Solteira, SP-Brazil: *Numerical modeling of wave-coastal structures interaction using a Lagrangian model*, 21 March to 3 April, 2010.
 - Training course at the National Laboratory of Civil Engineering – LNEC: *Maritime Hydraulic: numerical and physical modeling*. Course on the *SPH model: application in wave-structure interactions*, 14 to 23 October, 2008.
- Guidance of final year project of undergraduate student in Mechanical Engineering, at Department of Mechanical and Industrial Engineering (DEMI) of Faculty of Science and Technology of New University of Lisbon. Projects in fluid mechanics and hydrodynamic.

- Diogo Tavares da Rocha e Meireles Neto, 2008, *Study of flow around a fixed platform for offshore wind turbine* (Estudo do escoamento em torno de uma plataforma fixa para turbina eólica offshore).
- Miguel Brito, 2008, *Numerical study of aerodynamic profile of a competition vehicle* (Estudo numérico da aerodinâmica do perfil de um veículo de competição).
- António Manuel Anselmo, 2007, *Development of a virtual wave tank* (Desenvolvimento de um tanque de ondas virtual).
- João Luís Aveiro, 2007, *Development of a virtual wave tank* (Desenvolvimento de um tanque de ondas virtual).
- Fernando Rocha, 2005, *Numerical simulation of atmospheric flows: Wind in the Faculty of Science and Technology* (Simulação numérica de escoamentos atmosféricos: Aplicação ao estudo de vento na Faculdade de Ciências e Tecnologia).
- Igor Baltazar, 2005, *Numerical simulation of atmospheric flows: Wind in the Faculty of Science and Technology* (Simulação numérica de escoamentos atmosféricos: Aplicação ao estudo de vento na Faculdade de Ciências e Tecnologia).
- Tiago Silva, 2005, *Numerical simulation of atmospheric flows: Application to the wind on the deck of a frigate* (Simulação numérica de escoamentos atmosféricos: Aplicação ao estudo do vento na plataforma de uma fragata).
- Tiago Sousa, 2005, *Numerical simulation of atmospheric flows: Application to the wind on the deck of a frigate* (Simulação numérica de escoamentos atmosféricos: Aplicação ao estudo do vento na plataforma de uma fragata).
- Carlos Ventura e Diogo Oliveira, 2005, *Analysis of the flow past a tower* (Análise de escoamento em torno de uma torre de teleférico).
- Luis Pereira, Pedro Pereira e Rui Macedo, 2005, *Analysis and structural optimization of a tower* (Análise e optimização estrutural de uma torre de teleférico).
- David Gomez, Duarte Cruz, 2004, *Aerodynamic tests of the television tower of TDP Monsanto using FLUENT* (Ensaio aerodinâmico da torre de televisão da TDP em Monsanto usando FLUENT).
- Francisco Duque, Ricardo Pereira, 2004, *Aerodynamic tests of the television tower of TDP Monsanto using COSMOSFLOW* (Ensaio aerodinâmico da torre de televisão da TDP em Monsanto usando COSMOSFLOW).
- Luis Pereira, Pedro Antuno, Tiago Santos, Tiago Tenente, 2002, *Aerodynamic deflector for a truck* (Deflector aerodinâmico para um veículo pesado).

15.4. Scientific formation and initiation of research

Scientific formation and research initiation of undergraduate student in fluid mechanics and hydrodynamic and participation in congress

- Publication with students in National and International Conferences:
 - João Inverno, 2013, in *6th SCACR - International Short Course/Conference on Applied Coastal Research*.
 - Ricardo Martins, 2013, in *International Journal of Offshore and Polar Engineering*.
 - Ricardo Martins, 2012, in international conference *V Seminário e Workshop em Engenharia Oceânica – V SEMENGO*, Rio Grande, RS – Brasil.
 - Divyesh Parxotomo, 2013, in *Revista Iberoamericana de Ingeniería Mecánica*.
 - Ricardo Martins, 2012, in national conference *IV Conferência Nacional em Mecânica dos Fluidos, Termodinâmica e Energia*, Lisbon, Portugal.
 - Ricardo Martins, 2011, in national conference *7as Jornadas Portuguesas de Engenharia Costeira e Portuária*, Porto, Portugal.
 - Ricardo Martins, 2011, in international conference *Computational Methods in Marine Engineering IV – MARINE-2011*, Lisbon, Portugal.
 - Ricardo Martins, 2011, in international conference *Congresso de Métodos Numéricos em Engenharia – CMNE*, Coimbra, Portugal.
 - Moises Brito, 2011, in international conference *Congresso Ibero-Americano de Engenharia Mecânica – CIBEM 10*, Porto, Portugal.
 - Divyesh Parxotomo, 2011, in international conference *Congresso Ibero-Americano de Engenharia Mecânica – CIBEM 10*, Porto, Portugal.
 - Rúben Ramalhais, 2010, in national Brazilian conference *Seminário e Workshop em Engenharia Oceânica – IV SEMENGO*, Rio Grande, RG – Brazil.
 - Rúben Ramalhais, 2010, in national conference *Jornadas do Mar*, Escola Naval, Almada, Portugal.
 - Rúben Ramalhais, 2010, in international conference *13th Brazilian Congress of Thermal Sciences and Engineering – ENCIT 2010*, Uberlandia, MG – Brazil.
 - José Correia, 2010, in national conference *Jornadas do Mar*, Escola Naval, Almada, Portugal.
 - Bruno Henriques, 2010, in international conference *V European Conference on Computational Fluid Dynamics, ECCOMAS CFD 2010*, Lisbon, Portugal

- Tiago Barreiro, 2009, in national conference *6as Jornadas Portuguesas de Engenharia Costeira e Portuária*, Funchal-Madeira, Portugal
 - Tiago Barreiro, 2009, in national conference *III Conferência Nacional em Mecânica de Fluidos, Termodinâmica e Energia*, Bragança, Portugal.
 - Miguel Brito, 2008, in national conference *II Conferencia Nacional de Métodos Numéricos em Mecânica de Fluidos e Termodinâmica*, Aveiro, Portugal.
 - João Aveiro, 2007, in national conference *5as jornadas Portuguesas de Engenharia Costeira e Portuária*, Lisbon, Portugal.
 - António Anselmo, 2007, in national conference *5as jornadas Portuguesas de Engenharia Costeira e Portuária*, Lisbon, Portugal.
 - António Anselmo, 2007, in international conference *Métodos Numéricos e Computacionais em Engenharia - CMNE/CILAMCE*, Porto, Portugal.
 - António Anselmo e João Aveiro, 2006, in national conference *Jornadas do Mar 2006*, Escola Naval, Almada, Portugal.
 - Ana T. Marques, 2004, in national conference *Jornadas do Mar 2004 - "O Mar: um Oceano de Oportunidades"*, Escola Naval, Almada, Portugal.
- First Mechanical Engineering price obtained by Luciane de Oliveira, an undergraduate final year student of Engineering school of Federal University of Rio Grande – FURG, in the Conference “XXIV Congresso Regional de Iniciação Científica e Tecnológica em Engenharia - CRICTE”, with the paper: L. de Oliveira, P. Teixeira, E. Didier, 2010, Análise numérica da acção de onda sobre uma coluna de água oscilante. Proc. *XXIV Congresso Regional de Iniciação Científica e Tecnológica em Engenharia – CRICTE*, FURG, Rio Grande – RS, Brazil.
 - First Mechanical Engineering price obtained by Ana Marques, an undergraduate final year student of Department of Mechanical and Industrial Engineering (DEMI), in the conference “Jornadas do Mar 2004. O mar: um oceano de oportunidade”, with the paper: Ana T. Marques, Eric Didier, 2004, Os fenómenos não-lineares em hidrodinâmica marítima. Proc. *Jornadas do Mar 2004 - "O Mar: um Oceano de Oportunidades"*, pp 152-159, Escola Naval, Almada, Portugal.

16. Languages

- French, maternal language
- Portuguese, very good comprehension reading and oral, good written level
- English, good level reading, writing and oral

- Spanish, correct reading, elementary oral and writing

17. Conferences and workshops attended (paper presented)

Conferences and workshops attended with presentation, at least, of one paper in national and international conferences.

17.1. National conferences

- 8as Jornadas Portuguesas de Engenharia Costeira e Portuária, 10 and 11 October, Lisboa, Portugal, 2013.
- 2as Jornadas de Engenharia Hidrográfica, 20 to 22 June, Lisboa, Portugal, 2012.
- IV Conferência Nacional em Mecânica dos Fluidos, Termodinâmica e Energia, 28 and 29 May, Lisboa, Portugal, 2012.
- 7as Jornadas Portuguesas de Engenharia Costeira e Portuária, 6 and 7 October, Porto, Portugal, 2011.
- 1as Jornadas de Engenharia Hidrográfica, 21 and 22 June, Lisbon, Portugal, 2010.
- 10º Congresso da Água – Marcas d'Água, 21 to 24 March, Alvor, Algarve, Portugal, 2010.
- 6as Jornadas Portuguesas de Engenharia Costeira e Portuária, 8 and 9 October, Funchal, Madeira, Portugal, 2009.
- III Conferência Nacional em Mecânica de Fluidos, Termodinâmica e Energia, 17 and 18 September, Bragança, Portugal, 2009.
- II Conferencia Nacional de Métodos Numéricos em Mecânica de Fluidos e Termodinâmica, 8 and 9 May, Aveiro, Portugal, 2008.
- Congresso Engenharia'07 – Inovação e Desenvolvimento, 21 to 23 November, Covilhã, Portugal, 2007.
- 5as Jornadas Portuguesas de Engenharia Costeira e Portuária, 11 and 12 October, Lisbon, Portugal, 2007.
- Jornadas do Mar: Os oceanos, uma plataforma para o desenvolvimento, 13 to 17 November, Almada, Portugal, 2006.
- I Conferência Nacional de Métodos Numéricos em Mecânica dos Fluidos e Termodinâmica, 8 and 9 June, Monte de Caparica, Portugal, 2006.
- 4as Jornadas Portuguesas de Engenharia Costeira e Portuária, 20 and 21 October, Angra de Heroísmo, Açores, Portugal, 2005.

- Jornadas do Mar: O Mar, um Oceano de Oportunidades, 22 to 26 November, Almada, Portugal, 2004.
- VII Congresso de Mecânica Aplicada e Computacional, 14 to 16 April, Évora, Portugal, 2003.
- 3as Jornadas Portuguesas de Engenharia Costeira e Portuária, 13 and 14 November, Aveiro, Portugal, 2003.

17.2. International conferences

- 6th SCACR - International Short Course/Conference on Applied Coastal Research, Lisbon, Portugal, 2013.
- V SEMENGO – Seminário e Workshop em Engenharia Oceânica, 7-9 November, Rio Grande, RS-Brazil, 2012.
- Computational Methods in Marine Engineering IV – MARINE-2011, 28-30 September, Lisbon, Portugal, 2011.
- X Congresso Ibero-Americano em Engenharia Mecânica – CIBEM10, 4-7 September, Porto, Portugal, 2011.
- Congresso de Modelação Numérica em Engenharia – CMNE-2011, 14-17 June, Coimbra, Portugal, 2011.
- IV Seminário e Workshop em Engenharia Oceânica – SEMENGO, 3-5 November, Rio Grande, RS-Brasil, 2010.
- V European Conference on Computational Fluid Dynamics, ECCOMAS CFD 2010, 14-17 June, Lisbon, Portugal, 2010.
- Conference on Modelling Fluid Flow – CMFF'09, 9 to 12 September, Budapest, Hungary, 2009.
- 4th International SPHERIC Workshop on Smoothed Particles Hydrodynamics (SPH), 27 to 29 May, Nantes, France, 2009.
- 10th International Coastal Symposium – ICS2009, 13 to 18 April, Lisbon, Portugal, 2009.
- Mediterranean Days of Coastal and Port Engineering, 7 to 9 October, Palermo, Italy, 2008.
- 9th International Conference on Flow-Induced Vibrations – FIV 2008, 30 June - 3 July, Prague, Czech Republic, 2008.
- Congresso de Métodos Numéricos em Engenharia CMNE / XXVIII CILAMCE, 13 to 15 June, Porto, Portugal, 2007.
- Seventeenth International Offshore and Polar Engineering Conference - ISOPE, 1-6 July, Lisbon, Portugal, 2007.

- Conference on Modelling Fluid Flow – CMFF’06, 6-9 September, Budapest, Hungary, 2006.
- Conference on Adaptative Modeling and Simulation – ADMOS2005, Barcelona, Spain, 2005.
- 4th European & African Conference on Wind Engineering, 11 to 15 July, Prague, Czech Republic, 2005.
- Congresso em Métodos Numéricos en Ingeniería 2005, 4 to 7 July, Granada, Spain, 2004.
- Métodos Computacionais em Engenharia, 31 May to 2 June, Lisbon, Portugal, 2004.
- Conference on Modelling Fluid Flow – CMFF’03, 3 to 6 September, Budapest, Hungary, 2003.
- 9ième Journée de l’Hydrodynamique, 10 to 12 March, Poitiers, France, 2003.
- V Métodos Numéricos en Ingeniería, 3 to 6 June, Madrid, Spain, 2002.
- 8ième Journées de l’Hydrodynamique, 5 to 7 March, Nantes, France, 2001.
- Euromech 374 - Recent Computational Developments in Steady and Unsteady Naval Hydrodynamics, 27 to 29 April, Poitiers, France, 1998.

18. Conferences, workshops, Forums and Courses attended

- Jornadas de Investigação e Inovação – Recursos Naturais e Energia, 21-26 March, Lisbon, Portugal, 2012
- Lisbon Atlantic Conference – Economia e Ciência Marítimas do Atlântico para um Desenvolvimento Sustentável da Europa, 28 and 29 November, Lisbon, Portugal, 2011.
- Forum Ansys-Fluent, 10 November, Lisbon, Portugal, 2011.
- Roadmap Nacional em Energias Renováveis Offshore, Workshop, 30 June, Lisbon, Portugal, 2011.
- Conference on Morfodinâmica Estuários e Costeira, 3 and 4 February, Lisbon, Portugal, 2011.
- X Conference France-Air Portugal “Vision’air”, 30 September, Lisbon, Portugal, 2010.
- Presentation of Dr. Luís R. Rojas Solárzano from Universidade Simón Bolívar, Introduction to multiobjective optimization using Ansys Design Explorer, FCT-UNL, 4 August, Lisbon, Portugal, 2010.

- Workshop on Oceans as a Source of Energy, 17 and 18 May, Lisbon, Portugal, 2010.
- IX Conference France-Air, 22 October, Lisbon, Portugal, 2010.
- Forum Ansys-Fluent, 26 November, Lisbon, Portugal, 2009.
- VIII Conference France-Air, 22 October, Lisbon, Portugal, 2009.
- Forum Ansys-Fluent, 4 and 5 November, Madrid, Spain, 2008.
- 3rd Workshop on CFD Uncertainty Analysis, 23 and 24 October, IST, Lisbon, Portugal, 2008.
- 3rd International SPHERIC Workshop on the Smoothed Particles Hydrodynamics (SPH), 4 to 6 June, Lausanne, Suisse, 2008.
- Training Days SPHysics: Free-surface SPH Flow Solver, by Prof. M.G. Gesteira and Dr. A. Crespo (University of Vigo), Dr. B. Rogers (University of Manchester) and Prof. R.A. Dalrymple (University Johns Hopkins), 3 June, Lausanne, Suisse, 2008.
- Presentation by Dr. Terry Hedges, professor of University of Liverpool, *Galgamento em Estruturas de Protecção Marginal: Mitigação do Risco e Sistemas de Alerta de Inundações*, LNEC, 31 March, LNEC, Lisbon, Portugal, 2008.
- Seminar of Ocean wave energy, *Pavilhão do Conhecimento* in Lisbon, 11 November, Lisbon, Portugal, 2007.
- 2nd Workshop on CFD Uncertainty Analysis, 19 and 20 October, IST, Lisbon, Portugal, 2006.
- Fluent Forum, Lisbon, Portugal, 2005.
- Fluent Forum, Lisbon, Presentation of a poster and a communication, Portugal, 2004.
- Fluent Forum, Barcelona, Participation to the forum and presentation of the pedagogic use of Fluent in Industrial and Mechanics Engineering Department In “Universidade Nova de Lisboa”, Barcelona, Spain, 2003.

19. Publications

19.1. Theses

Publication of 2 Masters thesis and 1 PhD Thesis.

- Didier E., Simulation d'écoulements à surface libre sur des maillages déstructurés, Ph.D. Thesis, Fluid Mechanic Laboratory, Ecole Centrale de Nantes, University of Nantes, France, 2001.
- Didier E., Etude numérique du sillage lointain d'un navire par une méthode de singularités, Master Thesis, Fluid Mechanic Laboratory, Ecole Centrale de Nantes, University of Nantes, France, 1997.
- Didier E., Modélisation numérique des avalanches aérosols, Master Thesis, CEMAGREF - Grenoble, University of Joseph Fourier, Grenoble, France, 1993.

19.2. Papers in scientific periodicals

Publications of 16 papers in journals (published or accepted for publication): 15 papers in international journal and 1 in national journal, and first author in 11 papers.

- Didier E., Parxotomo D., 2014, Redução dos esforços num cilindro circular usando dois pequenos cilindros de controlo na esteira. *RIBIM - Revista Iberoamericana de Ingeniería Mecánica*, ISSN 1137-2729, 18(1). Accepted for publication.
- Teixeira P.R.F., Davyt D.P., Didier E., Ramalhais R., Numerical simulation of an oscillating water column device using a code based on Navier-Stokes equations. *ENERGY*, ISSN 0360-5442, 61, pp 513-530. WoS IF=4.107; CN=0; SCI Q1, “renewable energy, sustainability and the environment”, energy engineering and power technology”.
<http://dx.doi.org/10.1016/j.energy.2013.08.062>
- Neves M.G., Didier E., Robert M., Losada I.J., 2013, Reducción de la reflexión en el interior des puerto de Vila do Porto, Azores. *RIBIM - Revista Iberoamericana de Ingeniería Mecánica*, ISSN 1137-2729, 17(2), pp 139-148.
<http://www.uned.es/ribim/volumenes/Vol17N2Octubre2013/V17N2A11%20Neves.pdf>
- Didier E., Martins R., Neves M.G., 2013, Numerical and experimental modeling of regular wave interacting with a composite breakwater. *International Journal of Offshore and Polar Engineering*, ISSN 1053-5381, 23(1), pp 46-54. WoS:000315977500008; IF=0.502; CN=0; WoS Q3, “engineering, civil”, “engineering, ocean”; SCI Q2, “ocean engineering”, “Civil and Structural Engineering”, “Mechanical Engineering”.
<http://www.isopec.org/publications/publications.htm>
- Gonçalves R.A., Teixeira P.R.F., Didier E., 2012, Numerical simulations of low Reynolds number flows pas elastically mounted cylinder, *RETERM*, 11(1-2), pp 61-67.
http://demec.ufpr.br/reterm/ed_ant/19/artigos/255-2012.pdf
- Didier E., Neves D.C.B., Martins R., Neves M.G., 2012, Modelling of an impermeable breakwater: comparison between SPH numerical model and physical model, *RETERM*, 11(1-2), pp 68-76.
http://demec.ufpr.br/reterm/ed_ant/19/artigos/257-2012.pdf
- Didier E., Neves M.G., 2012, A semi-infinite numerical wave flume using Smoothed Particle Hydrodynamics. *International Journal of Offshore and Polar*

Engineering, ISSN 1053-5381, 22(3), pp 193-199.

WoS:000308521700003; IF=0.502; CN=1; WoS Q3, “engineering, civil”, “engineering, ocean”; SCI Q2, “ocean engineering”, “Civil and Structural Engineering”, “Mechanical Engineering”.

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- Didier E., 2012, Convergência assintótica das quantidades fundamentais na modelação numérica do escoamento em torno de um cilindro circular. *RIBIM - Revista Iberoamericana de Ingeniería Mecánica*, ISSN 1137-2729, 16(1), pp 87-99.
<http://www.uned.es/ribim/volumenes/Vol16N1Abril2012/V16n1A08%20Didier%2087-99.pdf>
- Davyt D.P., Teixeira P.R.F., Ramalhais R., Didier E., 2011, Numerical simulation of wave action over a wave energy device of the oscillating wave column type. *VETOR – Revista de Ciências Exatas e Engenharias*, ISSN 0102-7352, 21(1), pp 51-71.
<http://www.seer.furg.br/index.php/vetor/article/view/2566>
- Didier E., Neves M.G., 2010, Study of wave interaction with coastal structures using a SPH numerical model. *Journal of Integrated Coastal Zone Management*, ISSN 1646-8872, 10(4), pp 435-455.
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- Paixão Conde J.M., Didier E., Lopes M.F.P., Gato L.M.C., 2009, Nonlinear wave diffraction by a submerged horizontal circular cylinder. *International Journal of Offshore and Polar Engineering*, ISSN 1053-5381, 19(3), pp 198-205.
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http://e-geo.fcsh.unl.pt/ICS2009/docs/ICS2009_Volume_I/496.500_E.Didier_ICS2009.pdf
- Didier E. and Neves M.G., 2008, Estudo da interacção onda-estrutura utilizando um modelo numérico Lagrangiano. *Recursos Hidricos*, ISSN 0870-1741, 29(2), pp 15-26.
- Didier E., 2007, Simulação numérica de escoamentos com superfície livre. *RIBIM - Revista Iberoamericana de Ingeniería Mecánica*, ISSN 1137-2729, 11(3), pp 3-18.
http://www.uned.es/ribim/volumenes/Vol11N3Septiembre_2007/V11N3A01%20Didier.pdf
- Didier E. and Borges A.R.J., 2007, Numerical predictions of low Reynolds number flow over an oscillating circular cylinder. *Journal of Computational and Applied Mechanics*, HU ISSN 1586-2070, 8(1), pp 39-55.
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- Didier E., 2007, Flow simulation over two circular cylinders in tandem. *Comptes Rendus Mécanique*, ISSN 1631-0721, 335(11), pp 696-701. WoS:000251683300004; IF=0.969; CN=5; WoS Q3, “mechanics”; SCI Q3, “mechanics of materials”.
[doi 10.1016/j.crme.2007.10.002](https://doi.org/10.1016/j.crme.2007.10.002) 2007

19.3. Papers in international conference proceedings

Publications of 64 papers in international conference with referees with 27 papers as first author.

- Teixeira P.R.F., Gonçalves R.A., Didier E., 2013, Análise numérica da vibração induzida por vórtices a baixo números de Reynolds em um cilindro circular sob base elástica. Proc. *Congreso de Métodos Numéricos en Ingeniería, SEMNI*, Bilbao, Spain.
- Paixão Conde J.M., Fortes C.J.E.M., Didier E., Lemos R., Reis R., 2013, Ensaios experimentais de ondas bicromáticas com e sem rebentação. Proc. *Congreso de Métodos Numéricos en Ingeniería, SEMNI*, Bilbao, Spain.
- Didier E., Neves D.R.C.B, Teixeira P.R.F., Neves M.G., Soares H., Viegas M., 2013, Coupling of FLUINCO mesh-based and SPH mesh-free numerical codes for the modelling of wave overtopping over a porous breakwater. Proc. *6th SCACR – International Short Course/Conference on Applied Coastal Research*, Lisbon, Portugal, (10 p. CDRom).
- Ferreira O, Reis T., Carrasco A.R., Neves M.G., Neves D., Didier E., 2013, Small overtopping at Albufeira harbour: field measurements and modelling. Proc. *6th SCACR – International Short Course/Conference on Applied Coastal Research*, Lisbon, Portugal, (10 p. CDRom).
- Inverno J, Neves M.G., Didier E., 2013, Numerical simulation of wave interacting with a submarine outfall using IH-2VOF. Proc. *6th SCACR – International Short Course/Conference on Applied Coastal Research*, Lisbon, Portugal, (10 p. CDRom).
- Paixão Conde J.M., Fortes C.J.E.M., Didier E., Lemos R., Reis R., 2013, Physical modelling of bichromatic wave propagation and wave breaking in a wave flume. Proc. *6th SCACR – International Short Course/Conference on Applied Coastal Research*, Lisbon, Portugal, (10 p. CDRom).
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- Gonçalves R.A., Teixeira P.R.F., Didier E., 2012, Numerical analysis of the interaction among flows at low Reynolds numbers and elastically mounted cylinders. Proc. *14th Brazilian Congress of Thermal Sciences and Engineering - ENCIT 2012*, Rio de Janeiro, RJ – Brazil.
- Didier E., Neves D.R.C.B., Martins R., Neves M.G., 2012, Modelação de um quebra-mar de talude impermeável: comparação entre modelo numérico SPH e

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- Gonçalves R.A., Teixeira P.R.F., Didier E., 2012, Análise numérica da interação entre escoamentos a baixos números de Reynolds e cilindros apoiados em base elástica. Proc. *V Seminário e Workshop em Engenharia Oceânica – V SEMENGO*, ISBN 978-85-7566-236-7, Rio Grande, RS – Brazil, pp 124-131.
 - Neves D.R.C.B., Didier E., Reis T., Neves M.G., 2012, Overtopping of a porous structure using a Smoothed Particle Hydrodynamics numerical model. Proc. *Coastlab12 – Fourth International Conference on the Application of Physical Modelling to Port and Coastal Protection*, Ghent, Belgium.
 - Paixão Conde J.M., Fortes C.J.E.M., Didier E., Neves D.R.C.B., 2012, A contribution to the study of wave propagation and wave breaking: Physical and numerical modelling. Proc. *Coastlab12 – Fourth International Conference on the Application of Physical Modelling to Port and Coastal Protection*, Ghent, Belgium.
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 - Didier E., Martins R., Neves M.G., Vasco J.R.G., 2011, Interaction between wave and coastal structure: validation of two Lagrangian numerical models with experimental results. Proc. *Computational Methods in Marine Engineering IV – MARINE 2011*, ISBN 978-84-89925-31-1, Lisbon, Portugal, pp 134-145.
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 - Didier E., Paixão Conde J.M., Teixeira P.R.F., 2011, Numerical simulation of an oscillating water column wave energy converter with and without damping. Proc. *Computational Methods in Marine Engineering IV – MARINE 2011*, ISBN 978-84-89925-31-1, Lisbon, Portugal, pp 206-217. WOS:000313561400015.
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 - Gil L., Brito M., Didier E., Jorge B., 2011, Simulação numérica de tomadas de água utilizando as equações RANS. Proc. *X Congresso Ibero-americano em Engenharia Mecânica - CIBIM 10*, Eds R.M.N. Jorge, J.M.R.S. Tavares, J.L. Alexandre, A.J.M. Ferreira, M. Vaz, ISBN 978-989-96276-2-8, Porto, Portugal, pp 685-695.
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- Didier E., Martins R., Neves G., 2011, Análise da interacção entre uma onda regular e um quebra-mar misto usando um modelo numérico SPH. Proc. *Congresso de Métodos Numéricos em Engenharia – CMNE*, Coimbra, Portugal, pp 131 (20 p. CDRom).
- Paixão Conde J.M., Teixeira P.R.F., Didier E., 2011, Numerical simulation of an Oscillating Water Column Wave Energy Converter: Comparison of two numerical codes. Proc. *International Offshore (Ocean) and Polar Engineering Conference - ISOPE*, ISBN 978-1-880653-96-8, Maui, Hawaii, USA, pp 668-674. SCI Q2, “ocean engineering”.
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- Didier E., Neves M.G., 2010, Modelação de estruturas marítimas usando um modelo numérico Smoothed Particle Hydrodynamics. Proc. *Seminário e Workshop em Engenharia Oceânica – IV SEMENGO*, Rio Grande, RS – Brazil.
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- Oliveira L.O., Teixeira P.R.F., Didier E., 2010, Análise numérica da ação de onda sobre uma coluna de água oscilante. Proc. *XXIV CRICTE – Congresso Regional de Iniciação Científica e Tecnológica em Engenharia*, Rio Grande, RS - Brazil.
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- Neumann F., Brito Melo A., Didier E. and Sarmiento A., 2007, Full-scale data assessment in OWC Pico Plant. Proc. *7th European Wave and Tidal Energy Conference*, Porto, Portugal, pp 16 (7 p. CDrom).
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19.3. Papers in national conference proceedings

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Lisbon, 10 September 2013



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