

Axel MODAVE

CNRS research scientist, HDR

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Professional positions

- Since Oct 2016 **CNRS research scientist** (*chargé de recherche, classe normale, section 09 [mechanics]*)
ENSTA (Palaiseau, France) – Unité de Mathématique Appliquée
Équipe POEMS (UMR 7231, CNRS, Inria, ENSTA)
- Oct 2015
→ Sept 2016 **Postdoctoral Associate** at **VirginiaTech** (Blacksburg, VA, USA)
Department of Mathematics
Mentor: Tim Warburton
- Oct 2014
→ Sept 2015 **Postdoctoral Research Associate** at **Rice University** (Houston, TX, USA)
Department of Computational and Applied Mathematics
Mentor: Tim Warburton
- Feb 2014
→ June 2014 **Postdoctoral Researcher** at **Université catholique de Louvain** (Belgium)
Division “Applied Mathematics and Mechanics”
Mentor: Jean-Francois Remacle
- Sept 2008
→ Janv 2014 **Research and Teaching Assistant** at **Université de Liège** (Belgium)
Research unit “Mathematical Modeling and Methods” (Sept 2008 → May 2010)
Research unit “Applied and Computational Electromagnetics” (June 2010 → Jan 2014)
Advisors: Christophe Geuzaine and Éric Delhez

Associate positions

- Since Oct 2017 **Scientific collaborator** at **Université de Liège** (Belgium)
- Since Oct 2020 **Affiliated faculty** at **ENSTA** (France)

Education

- June 2024 **Habilitation à Diriger des Recherches [HDR]**
Institut Polytechnique de Paris (France)
Thesis: Contrib. to Efficient Finite Element Solvers for Time-Harmonic Wave Propagation Problems
- Sept 2008
→ Oct 2013 **Doctor of Engineering Sciences [PhD]**
Université de Liège (Belgium)
Thesis: Absorbing Layers for Wave-Like Time-Dependent Problems – Design, Discretization, Opti.
Advisors: Christophe Geuzaine (ULiège) and Éric Delhez (ULiège)
- Sept 2003
→ June 2008 **Physics Engineer with *summa cum laude***
Université de Liège (Belgium)

Awards, Scholarships and Funding

- 2022 – Funding from the center “*CIEDS*” of IP Paris (for several PhD and post-doc positions) – **co-P.I.**
- 2022 – **Industrial contract with SIEMENS** and the program “*Plan de relance*” (2-years post-doc funding) – **P.I.**
- 2021 – **ANR JCJC WavesDG** (ANR-21-CE46-0010) [[website](#)] – **P.I.**
- 2018 – DGA Grant (50% of a 3-years PhD funding) – **co-P.I.**
- 2017 – SMAI BOUM Project Funding to organize a scientific event
- 2014 – **F.R.S.-FNRS Postdoctoral Researcher Grant** (3-years post-doctoral grant)
- 2014 – WBI Excellence Grant (partial funding for 2-years research stay in the USA)
- 2014/2015 – BAEF Honorary Fellowship

- 2015 – NSF-funded Early Career Travel Award to attend *SIAM GS15*
- 2012 – SMAI Travel Grant “*Jeunes chercheurs*” to attend *Congrès d'Analyse Numérique*
- 2006/2007 – Pisart Grant for Pedagogic Support

Mentoring

Postdoctoral Researchers

- Since 2024/09 – Ahmed Chabib (*co-mentoring with C. Geuzaine [ULiège]*)
Topic: *GPU-accelerated HDG finite element solver for time-harmonic propagation problems*
- Since 2024/04 – Ari Rappaport (*co-mentoring with T. Chaumont-Frelet [Inria] and P. Ciarlet [ENSTA]*)
Topic: *HDG finite element method and DDM for time-harmonic electromagnetism in complex media*
- 2022/01 → 2024/01 – Rose-Cloé Meyer (*co-mentoring with H. Bériot [SIEMENS]*)
Topic: *GPU-accelerated DG finite element solvers for time-dependent acoustic wave propagation*

PhD Student

- Since 2023/10 – Timothée Raynaud (*co-mentoring (40%) with P. Marchand [Inria] and V. Doléan [TU/e]*)
Topic: *Analysis and acceleration of Krylov iterative methods for the num. solution of time-harmonic wave problems*
- Since 2022/10 – Simone Pescuma (*co-mentoring (70%) with G. Gabard [Le Mans U.]*)
Topic: *Novel discontinuous finite elements methods for time-Harmonic wave propagation*
- 2018/10 → 2021/12 – Damien Chicaud (*co-mentoring (50%) with P. Ciarlet [ENSTA Paris]*)
Topic: *Analysis of time-harmonic electromagnetic problems with complex anisotropic media*

Master Students

- 2023/04 → 2023/09 – Timothée Raynaud, M2 Student at Paris-Saclay University (*with P. Marchand*)
Topic: *Numerical study of the iterative solution of time-harmonic problems close to resonance*
- 2022/04 → 2022/08 – Simone Pescuma, M2 Student at Sorbonne University and Polimi (*with G. Gabard*)
Topic: *Plane-wave discontinuous Galerkin methods for Helmholtz problems*
- 2020/05 → 2020/07 – Quentin Krempf, M1 Student at ENSTA Paris
Topic: *Plus de science pour moins de code : Portage de codes C sur GPU avec OpenACC*
- 2019/05 → 2019/08 – Nassim Kesmia, M1 Student at Paris-Saclay University (*with S. Chaillat*)
Topic: *Preconditioned boundary element methods for time-harmonic wave propagation*
- 2018/03 → 2018/08 – Damien Chicaud, M2 Student at ENSTA ParisTech
Topic: *DG-FEM with high-order absorbing boundary conditions for Maxwell's equations*
- 2018/03 → 2018/08 – María José Castellano, M2 Student at UVSQ (*with S. Chaillat*)
Topic: *A comparison of BEMs for time-harmonic wave propagation*
- 2017/05 → 2017/07 – Ningyuan Hu, M1 Student at ENSTA ParisTech
Topic: *Absorbing Boundary Conditions for the Wave Equation (Finite Differences, Corners, Stability)*

Teaching

Since 2016, I am involved in engineering and master programs in applied mathematics at *ENSTA*, *IP Paris* and *Paris-Saclay University*. Before, I have been teaching assistant at *ULiège* and *UCLouvain* for BSc and MSc of Engineering Sciences, and a guest lecturer for the *Rice University*.

At *ENSTA* (France) ...

[L. = Lectures, T. = Training sessions, E. = Examination]

Academic year 2024-2025 (*planned*):

- Introduction to Optimization – Level L1 – Fall 2024 (T. 12h, E. 3h)
- Initiation to high performance computing – MSc 1 – Spring 2024 (L. 5h, T. 16h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2023 (L. 9h, T. 10h, E. 6h, Coordinator)

Academic year 2023-2024:

- Initiation to high performance computing – MSc 1 – Spring 2024 (L. 5h, T. 16h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2023 (L. 9h, T. 10h, E. 6h, Coordinator)

Academic year 2022-2023:

- Initiation to high performance computing – MSc 1 – Spring 2023 (L. 5h, T. 16h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2022 (L. 9h, T. 10h, E. 6h, Coordinator)

Academic year 2021-2022:

- Initiation to high performance computing – MSc 1 – Spring 2022 (L. 5h, T. 16h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2021 (L. 9h, T. 6h, E. 6h, Coordinator)
- Finite elements and boundary elements: parall., coupling and perf. – MSc 2 – Spring 2022 (L. 9h, E. 3h)

Academic year 2020-2021:

- High performance scientific computing – MSc 1 – Spring 2021 (L. 5h, T. 16h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2020 (L. 9h, T. 6h, E. 6h, Coordinator)
- Finite elements and boundary elements: parall., coupling and perf. – MSc 2 – Spring 2021 (L. 6h, E. 3h)

Academic year 2019-2020:

- High Performance Scientific Computing – MSc 1 – Spring 2020 (L. 8h, T. 18h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2019 (L. 14h, T. 24h, E. 3h, Coordinator)

Academic year 2018-2019:

- High Performance Scientific Computing – MSc 1 – Spring 2019 (L. 7h, T. 12h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2018 (L. 7h, T. 16h, E. 3h, Coordinator)
- The finite element method – MSc – Fall 2018 (T. 12h, E. 2h)

Academic year 2017-2018:

- The finite element method – MSc 1 – Fall 2017 (T. 12h, E. 2h)
- High Performance Scientific Computing – MSc 1 – Spring 2018 (L. 6h30, T. 14h, E. 1h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2017 (T. 16h)
- Mathematical models and discretisation in electromagnetism – MSc 2 – Spring 2018 (L. 7h)

Academic year 2016-2017:

- High performance scientific computing – MSc 1 – Spring 2017 (L. 8h, T. 24h, E. 1h, Coordinator)
- Parallel scientific computing – MSc 2 – Fall 2016 (T. 7h)
- Mathematical models and discretisation in electromagnetism – MSc 2 – Spring 2017 (L. 7h)

Before ...

At *Rice University* (USA):

- Numerical Analysis 1 – Undergraduate – Fall 2014 (Guest lecturer 2h)

At the *Université catholique de Louvain* (Belgium):

- Project of Structure – BSc – Spring 2014 (T. 8h)

At the *Université de Liège* (Belgium):

- Modeling and Design of Electromagnetic Systems – MSc – Fall 2013 (Guest lecturer 4h)
- Multiphysic Scientific Computational Projects – MSc – Spring 2011, 2012, 2013 (T. for projets)
- High performance scientific computing – MSc – Fall 2010, 2011 (T. for projets)
- Rational Mechanics – BSc – Fall 2009 (T. 30h)
- Algebra – BSc – Fall 2009 (T. 20h)
- Numerical Analysis – BSc – Fall 2007 (T. 20h)
- Continuum Mechanics – BSc – Spring 2007, 2008 (T. for projets)

Scientific animation and services

- Responsibilities:
 - Elected member of the **board of directors of ENSTA**, since 2022/03
 - Member of the scientific committee of the **mesocentre of IP Paris**, since 2021
 - Contact scientist of POEMS and UMA for “*Partnership & Promotion of Research*”, since 2021.
 - Member of the scientific committee of the program “*Mathematics of Scientific Computing and Engineering*” of the *Fondation Mathématique Jacques Hadamard* (FMJH), between 2023/01 and 2024/12

- Involved in academic bodies of the University of Liège (2005/10 → 2013/09) (faculty council, department council and bachelor/master councils)
- Organization of scientific meetings:
 - 2024/08: Member of the scientific committee of the *16th International Conference on Mathematical and Numerical Aspects of Wave Propagation (WAVES 2024)* at Berlin (Germany) [\[website\]](#)
 - 2024/01: Co-organization of the days of the laboratory POEMS (2 days, 30 participants) at Saint-Rémy-lès-Chevreuse (France)
 - 2023/08: Member of the scientific committee of the *13th International Symposium on Electric and Magnetic Fields (EMF 2023)* at Aix Marseille University (Marseille, France) [\[website\]](#)
 - 2023/08: Co-organization of a mini-symposium on “*High-order methods for wave propagation problems*” at ICOSAHOM 2023, with T. Chaumont-Frelet (Inria, France) [\[website\]](#)
 - 2022/07: Member of the organizing committee of the *15th International Conference on Mathematical and Numerical Aspects of Wave Propagation (WAVES 2022)* at ENSTA Paris (Palaiseau, France) [\[website\]](#)
 - 2022/06: Co-organization of a mini-symposium on “*Robust and scalable numerical methods for wave propagation: design, analysis and application*” at ECCOMAS 2022, with H. Barucq (Inria, France), T. Chaumont-Frelet (Inria, France) and R. Djellouli (Cal State Northridge, USA) [\[website\]](#)
 - 2020/11: Co-organization of the *2nd Young Researchers’ Days* on “*Waves*” (2 days, approx. 40 participants) with M. Bonazzoli (Inria, France), T. Chaumont-Frelet (Inria, France) and B. Thierry (CNRS, France) [\[website\]](#)
 - 2018/07: Co-organization of a mini-symposium on “*Accurate and Fast Numerical Solvers for Large-scale Wave Propagation Problems*” at WCCM 2018, with S. Chaillat (CNRS, France), J. Chan (Rice, USA) and A. Gillman (Rice, USA) [\[website\]](#)
 - 2017/10: Co-organization of the *1st Young Researchers’ Days* on “*Waves*” (2 days, 20 participants) at Paris (France) with B. Thierry (CNRS, France) [\[website\]](#)
 - 2013/05: Co-organization of the *2nd Gmsh Workshop* (2 days, 50 particip.) at Heure (Belgium) [\[website\]](#)
- External examiner in PhD committees:
 - 2025/02: Marie Jeanneteau (INSA Toulouse, France) *[Rapporteur]*
 - 2023/03: Anthony Royer (Liège U., Belgium)
 - 2021/06: Ruiyang Dai (Louvain-la-Neuve U. & Liège U., Belgium)
 - 2018/05: Michael Williamschen (Southampton U., UK)
- Reviewer for *Acta Acustica*, *Advances in Computational Mathematics*, *Applied Mathematics and Computation*, *Advanced Electromagnetics*, *Computers and Mathematics with Applications*, *Geophysical Journal International*, *International Journal of Numerical Modelling (Electronic Networks, Devices and Fields)*, *Journal of Computational and Applied Mathematics*, *Journal of Computational Physics*, *Journal of Scientific Computing*, *Numerische Mathematik*, *SIAM Journal on Numerical Analysis* and *SIAM Journal on Scientific Computing*.

Software

Since 2010, I have been developing and testing various numerical methods and implementation strategies for accelerated wave propagation with continuous and discontinuous finite element schemes.

- Since 2022 Main developer of the C++ parallel code **WavesDG**, an accelerated discontinuous finite element code dedicated to the solving time-harmonic wave propagation problems on modern parallel clusters. *Features: C++, MPI, OpenMP, 3D, high-order finite element, Hybridizable discontinuous Galerkin (HDG), iterative procedure, domain decomposition, vectorization, parallelization.* [\[website\]](#)
- Since 2022 Main developer of the MATLAB suite **WavesDGLab**, dedicated to the testing and numerical study of high-order finite element schemes and accelerated methods for solving time-harmonic wave propagation problems. *Features: MATLAB, 1D/2D, high-order finite element, continuous and discontinuous methods, substructuring methods, domain decomposition methods.* [\[website\]](#)
- 2014-2015 Co-developer of the industrial software **RiDG** for accelerated seismic imaging on GPU/CPU clusters. *Features: C++, OCCA (CUDA, OpenCL, OpenMP), MPI, high-order finite elements, discontinuous Galerkin (DG), multi-rate time stepping*
- 2010-2014 Co-developer of the academic software **Gmsh/dg** for time-domain wave propagation on CPU clusters. *Features: C++, MPI, high-order finite elements, discontinuous Galerkin (DG)*
- Since 2010 Advanced user of the open-source softwares **Gmsh** (mesh generator with pre- and post-processing facilities), **GetDP** (finite element solver) and **Onelab** (user-friendly interface)

List of publications and communications

Preprint

- [2] S. Pescuma, G. Gabard, T. Chaumont-Frelet, A. M. (2024). A hybridizable Discontinuous Galerkin method with transmission variables for time-harmonic wave problems in heterogeneous media. *Submitted for publication*. [\[preprint\]](#)
- [1] P. Ciarlet Jr, A. M. (2024). Analysis of time-harmonic electromagnetic problems with elliptic material coefficients. *Submitted for publication*. [\[preprint\]](#)

Papers in international journals

- [20] R.-C. Meyer, H. Bériot, G. Gabard, A. M. (2024). Coupling of discontinuous Galerkin and pseudo-spectral methods for time-dependent acoustic problems. *Journal of Theoretical and Computational Acoustics*, 32 (4), 2450017. [\[link\]](#) [\[preprint\]](#)
- [19] A. M., T. Chaumont-Frelet (2023). A hybridizable discontinuous Galerkin method with characteristic variables for Helmholtz problems. *Journal of Computational Physics*, 493, 112459, 21 pages [\[link\]](#) [\[preprint\]](#)
- [18] A. Royer, C. Geuzaine, E. Béchet, A. M. (2022). A non-overlapping domain decomposition method with perfectly matched layer transmission conditions for the Helmholtz equation. *Computer Methods in Applied Mechanics and Engineering*, 395, 115006, 24 pages [\[link\]](#) [\[preprint\]](#) [\[codes\]](#)
- [17] R. Dai, A. M., J.-F. Remacle, C. Geuzaine (2022). Multidirectionnal sweeping preconditioners with non-overlapping checkerboard domain decomposition for Helmholtz problems. *Journal of Computational Physics*, 453, 110887, 25 pages [\[link\]](#) [\[preprint\]](#) [\[codes\]](#)
- [16] D. Chicaud, P. Ciarlet, A. M. (2021). Analysis of variational formulations and low-regularity solutions for time-harmonic electromagnetic problems in complex anisotropic media. *SIAM Journal on Mathematical Analysis*, 53(3), 2691-2717, 24 pages [\[link\]](#) [\[preprint\]](#)
- [15] H. Bériot, A. M. (2021). An automatic PML for acoustic finite element simulations in convex domains of general shape. *International Journal for Numerical Methods in Engineering*, 122, 1239-1261, 24 pages [\[link\]](#) [\[preprint\]](#)
- [14] A. M., A. Royer, X. Antoine, X. Geuzaine (2020). A non-overlapping domain decomposition method with high-order transmission conditions and cross-point treatment for Helmholtz problems. *Computer Methods in Applied Mechanics and Engineering*, 368, 113162, 23 pages [\[link\]](#) [\[preprint\]](#) [\[codes\]](#)
- [13] A. M., X. Geuzaine, X. Antoine (2020). Corner treatments for high-order absorbing boundary conditions in high-frequency acoustic scattering problems. *Journal of Computational Physics*, 401, 109029, 24 pages [\[link\]](#) [\[preprint\]](#) [\[codes\]](#)
- [12] A. M., A. Atle, J. Chan, T. Warburton (2017). High-order absorbing boundary conditions with corner/edge compatibility for GPU-accelerated discontinuous Galerkin wave simulations. *International Journal of Numerical Methods in Engineering*, 112 (11), 1659-1686, 28 pages [\[link\]](#) [\[preprint\]](#)
- [11] A. M., J. Lambrechts, C. Geuzaine (2017). Perfectly Matched Layers for Convex Truncated Domains with Discontinuous Galerkin Finite Element Simulations. *Computers and Mathematics with Applications*, 73 (4), 684-700, 17 pages [\[link\]](#) [\[preprint\]](#) [\[movies\]](#)
- [10] J. Chan, Z. Wang, A. M., J.-F. Remacle, T. Warburton (2016). GPU-accelerated discontinuous Galerkin methods on hybrid meshes. *Journal of Computational Physics*, 318, 142-168, 27 pages [\[link\]](#) [\[preprint\]](#)
- [9] A. M., A. St-Cyr, T. Warburton (2016). GPU performance analysis of a nodal discontinuous Galerkin method for acoustic and elastic models. *Computers & Geosciences*, 91, 64-76, 13 pages [\[link\]](#) [\[preprint\]](#)
- [8] A. M., A. St-Cyr, W. A. Mulder, T. Warburton (2015). A nodal discontinuous Galerkin simulations for reverse-time migration on GPU clusters. *Geophysical Journal International*, 203 (2), 1419-1435, 17 pages [\[link\]](#) [\[preprint\]](#)
- [7] A. M., E. Delhez, C. Geuzaine (2014). Optimizing Perfectly Matched Layers in Discrete Contexts. *International Journal of Numerical Methods in Engineering*, 99 (6), 410-437, 28 pages [\[link\]](#) [\[preprint\]](#)
- [6] M. Boubekeur, A. Kameni, L. Pichon, A. M., C. Geuzaine (2014). Analysis of transient scattering problems using a discontinuous Galerkin method: application to the shielding effectiveness of enclosures with heterogeneous walls. *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, 27 (3), 626-635, 10 pages [\[link\]](#) [\[preprint\]](#)
- [5] M. Boubekeur, A. Kameni, L. Bernard, A. M., L. Pichon (2014). 3-D Modeling of Thin Sheets in the Discontinuous Galerkin Method for Transient Scattering Analysis. *IEEE Transactions on Magnetics*, 50 (2), 4 pages [\[link\]](#) [\[preprint\]](#)

- [4] M. Boubekur, A. Kameni, A. M., L. Bernard, L. Pichon (2013). Modeling of Weakly Conducting Thin Sheets in the Discontinuous Galerkin Method for Shielding Effectiveness Evaluation. *ACES Journal*, 28 (10), 7 pages [\[link\]](#) [\[preprint\]](#)
- [3] A. M., A. Kameni, J. Lambrechts, E. Delhez, L. Pichon. C. Geuzaine (2013). An optimum PML for scattering problems in the time domain. *The European Physical Journal - Applied Physics*, 64 (2), 6 pages [\[link\]](#) [\[preprint\]](#)
- [2] A. Kameni, A. M., M. Boubekur, V. Preault, L. Pichon, C. Geuzaine (2013). Evaluation of shielding effectiveness of composite wall with a Time Domain Discontinuous Galerkin Method. *The European Physical Journal - Applied Physics*, 64 (2), 4 pages [\[link\]](#) [\[preprint\]](#)
- [1] A. M., E. Deleersnijder, E. Delhez (2010). On the parameters of absorbing layers for shallow water models. *Ocean Dynamics*, 60 (1), 65-79, 15 pages [\[link\]](#) [\[preprint\]](#)

Theses

- [3] “Contributions to Efficient Finite Element Solvers for Time-Harmonic Wave Propagation Problems”
HDR thesis, Institut Polytechnique de Paris, France, June 2024
- [2] “Absorbing Layers for Wave-Like Time-Dependent Problems – Design, Discretization and Optimization”
PhD thesis, University of Liège, Belgium, October 2013
Advisors: Prof. Christophe Geuzaine and Prof. Éric Delhez
- [1] “Étude de modèles de frontière ouverte pour des problèmes de propagation d’ondes” (in french)
Master thesis, University of Liège, Belgium, June 2008
Advisor: Prof. Éric Delhez

International conferences (first name in the list of authors = speaker)

38. A. M.. Accelerated iterative DG finite element solvers for large-scale time-harmonic acoustic problems. Talk at the *53rd International Congress & Exposition on Noise Control Engineering (inter-noise 2024)* – Nantes (France) – August 25-29, 2024 – [7-pages paper](#)
37. A. M., T. Chaumont-Frelet, G. Gabard, S. Pescuma, A. E. Rappaport. A parallel HDG finite element method for the accelerated iterative solution of Helmholtz problems. Talk at the *16th International Conference on Mathematical and Numerical Aspects of Waves Propagation (WAVES 2024)* – Berlin (Germany) – June 30-July 5, 2024 – [2-pages paper](#)
36. A. M., T. Chaumont-Frelet. Iterative solvers based on hybridizable discontinuous Galerkin methods for time-harmonic problems. [Minisymposium talk](#) at the *SIAM Conference on Applied Linear Algebra (LA24)* – Paris (France) – May 13-17, 2024
35. A. M., T. Chaumont-Frelet. A hybridizable discontinuous Galerkin method with characteristic variables for time-harmonic problems. Talk at the *13th International Symposium on Electric and Magnetic Fields (EMF 2013)* – Marseille (France) – August 28-31, 2023
34. A. M., T. Chaumont-Frelet. A hybridizable discontinuous Galerkin method with characteristic variables for Helmholtz problems. [Minisymposium talk](#) at the *International Conference on Spectral and High Order Methods (ICOSAHOM 2023)* – Yonsei University (Seoul, Korea) – August 14-18, 2023
33. A. M., T. Chaumont-Frelet. A hybridizable discontinuous Galerkin method with characteristic variables for Helmholtz problems. [Minisymposium talk](#) at the *29th Biennial Numerical Analysis Conference* – University of Strathclyde (Glasgow, UK) – June 27-30, 2023
32. A. M., T. Chaumont-Frelet. A hybridizable discontinuous Galerkin method with characteristic variables for Helmholtz problems. [Minisymposium talk](#) at the *15th SIAM Conference on Computational Science and Engineering (CSE23)* – Amsterdam (The Netherlands) – February 26-March 3, 2023
31. A. M., H. Bériot. A PML implementation for convex domains of general shape in time-harmonic acoustics. Talk at the *15th International Conference on Mathematical and Numerical Aspects of Waves Propagation (WAVES 2022)* – Palaiseau (France) – July 25-29, 2022 – [2-pages paper](#)
30. A. M., A. Royer, C. Geuzaine. A non-overlapping DDM with PML transmission conditions and checkerboard partitions for Helmholtz problems. [Invited talk](#) at the *ICMS@Strathclyde: Solvers for frequency-domain wave problems and applications* – Glasgow (UK) – June 20-24, 2022
29. A. M., H. Bériot. An automatic PML for convex domains of general shape in time-harmonic acoustics. [Minisymposium talk](#) at the *ECCOMAS congress* – Oslo (Norway) – June 5-9, 2022
28. A. M., X. Antoine, C. Geuzaine. High-order Absorbing Boundary Conditions with Corner Treatment for the Finite Element Solution of Helmholtz Problems. Talk at the *18th European Finite Element Fair* – Paris (France) – September 10-11, 2021
27. A. M., X. Antoine, A. Royer, C. Geuzaine. A non-overlapping domain decomposition method with high-order transmission conditions and cross-point treatment for Helmholtz problems. [Minisymposium talk](#) at the *WCCM-ECCOMAS congress* – On line – January 11-15, 2021

26. A. Royer, [A. M.](#), E. Béchet, C. Geuzaine. A non-overlapping domain decomposition method with perfectly matched layer transmission conditions. Talk at the *26th International Domain Decomposition Conference (DD26)* – On line – December 7-12, 2020
25. [A. M.](#), X. Antoine, A. Royer, C. Geuzaine. A non-overlapping domain decomposition method with high-order transmission conditions and crosspoint treatment for Helmholtz problems. Talk at the *26th International Domain Decomposition Conference (DD26)* – On line – December 7-12, 2020
24. R. Dai, [A. M.](#), J-F. Remacle, C. Geuzaine. Parallel sweeping preconditioners for rectangular domain decompositions with cross points applied to the Helmholtz equation . Talk at the *26th International Domain Decomposition Conference (DD26)* – On line – December 7-12, 2020
23. [A. M.](#) An efficient domain decomposition method with cross-point treatment for Helmholtz problems. Talk at the *CIRM conference on "Parallel Solution Methods for Systems Arising from PDEs"* – Marseille (France) – September 16-20, 2019
22. [A. M.](#), X. Antoine, A. Royer, C. Geuzaine. An Efficient Domain Decomposition Method with Cross-point Treatment for Helmholtz Problems. [Minisymposium talk](#) at the *14th International Conference on Mathematical and Numerical Aspects of Waves Propagation (WAVES 2019)* – Vienna (Austria) – August 25-30, 2019 – [2-pages paper](#)
21. D. Chicaud, P. Ciarlet, [A. M.](#). Perturbed edge finite element method for the simulation of electromagnetic waves in magnetised plasmas. Talk at the *14th International Conference on Mathematical and Numerical Aspects of Waves Propagation (WAVES 2019)* – Vienna (Austria) – August 25-30, 2019 – [2-pages paper](#)
20. [A. M.](#), X. Antoine, C. Geuzaine. An Efficient Domain Decomposition Method with Cross-point Treatment for Helmholtz Problems. [Minisymposium talk](#) at the *SIAM Conference on Computational Science and Engineering (CSE19)* – Spokane (Washington, USA) – February 25-March 1, 2019
19. [A. M.](#), X. Antoine, C. Geuzaine. An efficient DDM with cross-point treatment for Helmholtz problems. [Minisymposium talk](#) at the *XXXIX Ibero-Latin American Congress on Computational Methods in Engineering (CILAMCE 2018)* – Paris/Compiègne (France) – November 11-14, 2018 – [4-pages paper](#)
18. [A. M.](#), X. Antoine, C. Geuzaine. An Efficient DDM with Cross-points for the Parallel Finite Element Solution of Helmholtz Problems. [Minisymposium talk](#) at the *13th World Congress on Computational Mechanics (WCCM 2018)* – New York City (NY, USA) – July 22-27, 2018
17. [A. M.](#), V. Mattessi, C. Geuzaine. High-order absorbing boundary conditions with edge and corner compatibility for the Helmholtz equation. [Minisymposium talk](#) at the *7th International Conference on Advanced Computational Methods in Engineering (ACOMEN 2017)* – Ghent (Belgium) – September 18-22, 2017 – [2-pages paper](#)
16. [A. M.](#), A. Atle, J. Chan, T. Warburton. A nodal discontinuous Galerkin method with high-order absorbing boundary conditions and corner/edge compatibility. Talk at the *13th International Conference on Mathematical and Numerical Aspects of Waves Propagation (WAVES 2017)* – Minneapolis (USA) – May 15-19, 2017 – [2-pages paper](#)
15. [A. M.](#), A. Atle, J. Chan, R. Hewett, T. Warburton. High-Order Absorbing Boundary Conditions for Time-Domain Wave Propagation with DG Methods. [Minisymposium talk](#) at the *SIAM Conference on Computational Science and Engineering (CSE17)* – Atlanta (Georgia, USA) – February 27-March 3, 2017
14. [A. M.](#), J. Chan, T. Warburton. GPU Performance Analysis of Discontinuous Galerkin Implementations for Time-Domain Seismic Wave Propagation. [Talk in a HPC dedicated session](#) at the *78th EAGE Conference & Exhibition* – Vienna (Austria) – May 30-June 2, 2016
13. [A. M.](#), J. Chan, T. Warburton. GPU Performance Analysis of Discontinuous Galerkin Implementations for Time-Domain Wave Simulations. Talk at the *17th SIAM Conference on Parallel Processing for Scientific Computing (PP16)* – Paris (France) – April 12-15, 2016
12. [A. M.](#), A. St-Cyr, T. Warburton. Performance of DGTD Finite Element Methods for the RTM Procedure on GPU Clusters. Talk at the *2016 Oil & Gas HPC Conference* – Houston (Texas, USA) – March 2-3, 2016
11. [A. M.](#), A. St-Cyr, T. Warburton, W. A. Mulder. Accelerated Discontinuous Galerkin Time-Domain Simulations for Seismic Imaging. [Minisymposium talk](#) at the *SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS15)* – Stanford (California, USA) – June 29-July 2, 2015
10. [A. M.](#), A. St-Cyr, T. Warburton, W. A. Mulder. Accelerated Discontinuous Galerkin Time-Domain Simulations for Seismic Wave Propagation. [Talk in a HPC dedicated session](#) at the *77th EAGE Conference & Exhibition* – Madrid (Spain) – June 1-4, 2015
9. [A. M.](#), D. Medina, A. St-Cyr, T. Warburton. RiDG: A Portable High-Performance Simulation Tool for Seismic Imaging. Talk at the *2015 Oil & Gas HPC Workshop* – Houston (Texas, USA) – March 4-5, 2015
8. M. Boubekour, A. Kameni, L. Bernard, [A. M.](#), L. Pichon (2013). 3D Modeling of Thin Resistive Sheets in the Discontinuous Galerkin Method for Transient Scattering Analysis. Poster at the *19th Conference on the Computation of Electromagnetic Fields (COMPUMAG 2013)* – Budapest (Hungary) – 30 June-4 July, 2013 – [2-pages paper](#)
7. [A. M.](#), J. Lambrechts, E. Delhez, C. Geuzaine. A PML for convex truncated domains in time-dependent acoustics

- with a DG-FE discretization. Talk at the *11th International Conference on Mathematical and Numerical Aspects of Waves Propagation* (WAVES 2013) – Gammarth (Tunisia) – June 3-7, 2013 – [2-pages paper](#)
6. A. M., C. Geuzaine, M. Boubekur, L. Pichon, A. Kameni. Evaluation of Shielding Effectiveness in the Time Domain using a DG Method with an Efficient PML. Poster at the *9th International Symposium on Electric and Magnetic Fields* (EMF 2013) – Bruges (Belgium) – April 23-25, 2013
 5. A. M., E. Delhez, A. Kameni, L. Pichon, C. Geuzaine. An optimum PML for scattering problems in the time domain. Talk at the *7e Conférence Européenne sur les Méthodes Numériques en Electromagnétisme* (NUMELEC 2012) – Marseilles (France) – July 3-5, 2012 – [2-pages paper](#)
 4. A. Kameni, A. M., M. Boubekur, C. Geuzaine, L. Pichon. Évaluation de l'efficacité de blindage de parois hétérogènes par une méthode de Galerkin discontinue en domaine temporel. Poster at the *7th European Conference on Numerical Methods in Electromagnetism* (NUMELEC 2012) – Marseilles (France) – July 3-5, 2012 – [2-pages paper](#)
 3. A. M., E. Delhez, C. Geuzaine. On the Parameters of the Perfectly Matched Layer in Discrete Contexts. Talk at the *10th International Conference on Mathematical and Numerical Aspects of Waves Propagation* (WAVES 2011) – Vancouver (Canada) – July 25-29, 2011 – [4-pages paper](#)
 2. A. M., E. Delhez, C. Geuzaine. Optimization of the PML in the Discrete Context for Wave-Like Problems. Talk at the *7th International Congress on Industrial and Applied Mathematics* (ICIAM 2011) – Vancouver (Canada) – July 18-22, 2011
 1. A. M., E. Deleersnijder, E. Delhez. Absorbing layers for shallow water models. Talk at the *15th Biennial Workshop of the Joint Numerical Sea Modelling Group* (JONSMOD 2010) – Delft (The Netherlands) – May 12-10, 2010

National conferences

6. A. M., T. Chaumont-Frelet. A hybridizable discontinuous Galerkin method with characteristic variables for Helmholtz problems. Talk at the *Journées Ondes du Sud-Ouest* (JOSO 2013) – Toulouse (France) – March 14-16, 2013
5. A. M., X. Antoine, C. Geuzaine. An efficient domain decomposition method with cross-point treatment for Helmholtz problems. Talk at the *14ème Colloque National en Calcul des Structures* (CSMA 2019) – Giens (France) – May 13-17, 2019
4. A. M., X. Antoine, C. Geuzaine. Conditions aux limites absorbantes d'ordre élevé pour l'équation de Helmholtz : traitement des coins et application en DDM. **Minisymposium talk** at the *44e Congrès National d'Analyse Numérique* (CANUM 2018) – Cap d'Agde (France) – May 28-June 1, 2018
3. A. M. An efficient DDM with cross-points for the parallel finite element solution of Helmholtz problems. **Invited talk** and poster at the *Journées "Advanced Theoretical and Numerical Methods for waves in structured Media"* organized by the thematic group "Modélisation et simulation" (GT1) of GDR Ondes – Paris (France) – March 13-14, 2018
2. A. M., E. Delhez, C. Geuzaine. Optimisation des PML dans des contextes discrets. Talk at the *41e Congrès National d'Analyse Numérique* (CANUM 2012) – Superbesse (France) – May 21-25, 2012
1. A. M. Optimizing the PML in the discrete context. **Invited talk** at the *Journées de Metz 2012 "Recent Advances in Modeling, Analysis and Simulation of Wave Propagation"* – Metz (France) – March 29-31, 2012

Seminars and others talks

20. Colloquium at the *Centre for Analysis, Scientific Computing and Applications* (CASA) – TU/e, Eindhoven (The Netherlands) – October 9, 2024
19. Seminar at research team ATLANTIS (Inria) – Sophia-Antipolis (France) – February 14, 2023
18. Invited talk at the EAA/UKAN summer school on computational acoustics – On line – July 5-9, 2021
17. Invited talk at the meeting day of DEFI, MEDISIM and POEMS – Palaiseau (France) – December 18, 2019
16. Seminar at the *Laboratoire de mécanique et d'acoustique* (LMA) – Marseilles (France) – July 16, 2019
15. Seminar of applied analysis at the LAMFA – Amiens (France) – April 29, 2019
14. Seminar of numerical analysis at the IRMAR – Rennes (France) – June 15, 2017
13. Colloquium at *VirginiaTech*, department of mathematics – Blacksburg (Virginia, USA) – March 25, 2016
12. Industrial seminar at *TOTAL E&P* – Houston (Texas, USA) – January 21, 2016
11. Seminar of the research team MAGIQUE-3D (Inria) – Pau (France) – January 5, 2016
10. Seminar of the research team POEMS (CNRS, Inria, ENSTA) – Palaiseau (France) – December 17, 2015
9. Seminar of numerical methods at the LJLL, UPMC – Paris (France) – December 14, 2015
8. Seminar at *VirginiaTech*, SIAM Student Chapter – Blacksburg (Virginia, USA) – November 19, 2015
7. Industrial seminar at *Shell Technology Center* – Rijswijk (The Netherlands) – June 9, 2015

6. Seminar of the graduate students in mathematics at SMU – Dallas (Texas, USA) – April 14, 2015
5. Seminar at *University of A Coruña*, SINUMAR – A Coruña (Spain) – July 17, 2014
4. Seminar at research team NACHOS (Inria) – Sophia-Antipolis (France) – June 3, 2014
3. Seminar at *Université catholique de Louvain* (UCL) – Louvain-la-Neuve (Belgium) – February 10, 2014
2. Invited talk at 1st Gmsh Workshop – Braives (Belgium) – September 15-16, 2011
1. Invited talk at ANR MicroWave – Nancy (France) – December 2-3, 2010