

Axel MODAVE

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Professional positions

- Since Oct 2016 **CNRS research scientist** (*chargé de recherche, classe normale*)
ENSTA Paris (Palaiseau, France) – Unité de Mathématique Appliquée
Équipe POEMS (UMR 7231, CNRS, INRIA, Ensta Paris)
- Oct 2015
→ Sept 2016 **Postdoctoral Associate** at **Virginia Tech** (Blacksburg, VA, USA)
Department of Mathematics
Mentor: Prof. Tim Warburton
- Oct 2014
→ Sept 2015 **Postdoctoral Research Associate** at **Rice University** (Houston, TX, USA)
Department of Computational and Applied Mathematics
Mentor: Prof. Tim Warburton
- Feb 2014
→ June 2014 **Postdoctoral Researcher** at **Université catholique de Louvain** (Belgium)
Division “Applied Mathematics and Mechanics”
Mentor: Prof. 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: Prof. Christophe Geuzaine and Prof. Éric Delhez

Associate positions

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

Education

- Sept 2008
→ Oct 2013 **Doctor of Engineering Sciences**
Université de Liège (Belgium)
- Sept 2003
→ June 2008 **Physics Engineer with *summa cum laude***
Université de Liège (Belgium)

Awards, Scholarships and Funding

- 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 2022/01 – Rose-Cloé Meyer (*co-mentoring with Hadrien Beriot*)
Topic: *Accelerated discontinuous finite element solvers for time-dependent acoustic wave propagation*

PhD Student

- 2018/10 → 2021/12 – Damien Chicaud (*co-mentoring (50%) with Patrick Ciarlet*)
Topic: *Analysis of time-harmonic electromagnetic problems with complex anisotropic media*

Master Students

- 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 (*50%, with Stéphanie 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 (*50%, with Stéphanie 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 Paris, IP Paris and Paris-Saclay University. Before, I have been teaching assistant at the Université de Liège and the Université catholique de Louvain for BSc and MSc of Engineering Sciences, and a guest lecturer for the Rice University.

At ENSTA Paris (France) ...

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

Academic year 2021/2022 (*planned*):

- 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

- Organization of scientific meetings:
 - 2022/07: Involved in the organization of the *15th International Conference on Mathematical and Numerical Aspects of Wave Propagation (WAVES 2022)* at ENSTA Paris (Palaiseau, France) [\[website\]](#)
 - 2020/11: Co-organization of *Young Researchers' Days* on “*Numerical Methods for Time-Harmonic Wave Propagation Solvers*” (2 days, approx. 40 participants) with Marcella Bonazzoli (INRIA), Théophile Chaumont-Frelet (INRIA) and Bertrand Thierry (CNRS) [\[website\]](#)
 - 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, POEMS, France), J. Chan (Rice, USA) and A. Gillman (Rice, USA) [\[website\]](#)
 - 2017/10: Co-organization of *Young Researchers' Days* on “*Large-Scale Wave Propagation Solvers*” (2 days, 20 participants) with Bertrand Thierry (CNRS, LJLL, France) [\[website\]](#)
 - 2013/05: Co-organization of the 2nd Gmsh Workshop (2 days, 50 participants) [\[website\]](#)
- External examiner in PhD committees:
 - 2018/05: Michael Williamschen (Southampton U., UK)
 - 2021/06: Ruiyang Dai (Louvain-la-Neuve U. & Liège U., Belgium)
- Reviewer for *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*, *SIAM Journal on Numerical Analysis* and *SIAM Journal on Scientific Computing*.
- Other responsibilities:
 - Member of the scientific committee of the mesocentre of Institut Polytechnique de Paris
 - Involved in academic bodies of the University of Liège (2005-10 → 2013-09) (faculty council, department council and bachelor/master councils)

Software

- Developer of testing codes to evaluate implementation strategies for accelerated wave propagation with continuous and discontinuous finite element schemes.
- Co-developer (2014-2015, leader) of an industrial software (*RiDG*) for accelerated seismic imaging on GPU/CPU clusters, discontinuous finite element schemes, C++ code with **OSCA** (CUDA, OpenCL and OpenMP) and MPI
- Co-developer (2010-2014) of an academic software (*Gmsh/dg*) for time-domain wave propagation on CPU clusters, discontinuous finite element schemes, C++ code with MPI
- Advanced user (since 2010) 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

- [1] A. Royer, C. Geuzaine, E. Béchet, A. M. (2021). A non-overlapping domain decomposition method with perfectly matched layer transmission conditions for the Helmholtz equation. Submitted, 25 pages [\[preprint\]](#)

Papers in international journals

- [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 [\[link\]](#) [\[preprint\]](#)
- [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. Boubekour, 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. Boubekour, 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. Boubekour, 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. Boubekour, 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

- [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)

- 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. 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. Rémacle, 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. Talk in a minisymposium 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. Talk in a minisymposium 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. Talk in a minisymposium 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. Talk in a minisymposium 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. Talk in a minisymposium 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. Talk in a minisymposium 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. Talk in a minisymposium 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. Boubekour, 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. Boubekour, 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

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. Talk in a minisymposium 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

18. Invited talk at the EAA/UKAN summer school on computational acoustics – On line – July 5-9, 2021
Domain decomposition methods for the finite element solution of time-harmonic acoustic problems
17. Invited talk at the meeting day of DEFI, MEDISIM and POEMS – Palaiseau (France) – December 18, 2019
A domain decomposition method with cross-point treatment for time-harmonic acoustic scattering problems
16. Seminar at the *Laboratoire de mécanique et d'acoustique (LMA)* – Marseilles (France) – July 16, 2019
Résolution numérique de l'équation de Helmholtz

15. Seminar of applied analysis at the LAMFA – Amiens (France) – April 29, 2019
Conditions aux limites absorbantes d'ordre élevé pour l'équation de Helmholtz
14. Seminar of numerical analysis at the IRMAR – Rennes (France) – June 15, 2017
Propagation d'ondes transitoires en milieu non-borné par éléments finis discontinus
13. Colloquium at *VirginiaTech*, department of mathematics – Blacksburg (Virginia, USA) – March 25, 2016
Nonreflective boundary treatments for time-domain wave propagation simulations
12. Industrial seminar at *TOTAL E&P* – Houston (Texas, USA) – January 21, 2016
Accelerated time-domain wave simulations with DGTD schemes
11. Seminar of the research team MAGIQUE-3D (INRIA) – Pau (France) – January 5, 2016
Simulations d'ondes en milieux ouverts avec schémas DGTD et clusters de GPUs
10. Seminar of the research team POEMS (CNRS, INRIA, ENSTA) – Palaiseau (France) – December 17, 2015
Simulations d'ondes en milieux ouverts avec schémas DGTD et clusters de GPUs
9. Seminar of numerical methods at the LJLL, UPMC – Paris (France) – December 14, 2015
Simulations d'ondes en milieux ouverts avec schémas DGTD et clusters de GPUs
8. Seminar at *VirginiaTech*, SIAM Student Chapter – Blacksburg (Virginia, USA) – November 19, 2015
GPU-accelerated nodal discontinuous Galerkin method for time-domain wave propagation
7. Industrial seminar at *Shell Technology Center* – Rijswijk (The Netherlands) – June 9, 2015
Nodal discontinuous Galerkin simulations for reverse-time migration on GPU clusters
6. Seminar of the graduate students in mathematics at SMU – Dallas (Texas, USA) – April 14, 2015
Perfectly matched layers for wave-like time-dependent problems
5. Seminar at *University of A Coruña*, SINUMAR – A Coruña (Spain) – July 17, 2014
Perfectly matched layers for time-dependent Acoustic problems
4. Seminar at research team NACHOS (INRIA) – Sophia-Antipolis (France) – June 3, 2014
Perfectly matched layers for time-dependent Acoustic problems
3. Seminar at *Université catholique de Louvain* (UCL) – Louvain-la-Neuve (Belgium) – February 10, 2014
Frontières artificielles sans réflexion pour la résolution numérique de problèmes d'ondes
2. Invited talk at 1st Gmsh Workshop – Braives (Belgium) – September 15-16, 2011
Gmsh projects "Electromagnetism"
1. Invited talk at ANR MicroWave – Nancy (France) – December 2-3, 2010
Optimisation of the absorption coefficient for time-dependent problems with PML