

CURRICULUM VITAE

Dr. PhD. Francesca RAPETTI GABELLINI

Assistant professor in applied mathematics, since sept. 2000

Birth place : Genova (IT). Birth date : 3/1/1970.

Married, 3 children, Italian nationality

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Academic Career

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| • 20 June 2008 | Habilitation à diriger des recherches
Specialty :
Subject :

Referees : | Université de Nice Sophia-Antipolis

Applied mathematics
High-order variational methods on simplicial meshes : applications to computational electromagnetics
Prof. Claudio Canuto (Polytechnical School, Turin),
Prof. Patrick Ciarlet Jr. (ENSTA, Paris),
Prof. Anthony Patera (MIT, Boston) |
| • 29 May 2000 | PhD,
Specialty :
Advisor :
Subject :

Referees :

Score : | Université Pierre et Marie Curie (Paris VI)
Applied Mathematics
Prof. Yvon Maday (Paris VI)
Approximation of the magnetodynamic equations in moving domains by the mortar element method
Prof. Jacques Rappaz (EPFL, Lausanne),
Prof. Alain Bossavit (EDF, Paris)
<i>Très honorable avec félicitations</i> |
| • 28 February 1995 | Degree in mathematics,
Specialty :
Advisor :
Subject :

Score : | University of Milan (Italy)
Applied mathematics
Prof. Alfio Quarteroni (Polytechnical School, Milan)
Approximation of elastostatic and elastodynamic problems by the finite element method
<i>magna cum laude</i> |
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Research key-words : Domain decomposition methods, solvers and preconditioners for PDEs, h -, p -, hp -finite element/spectral element methods for PDEs over unstructured meshes, conforming and non-conforming (mortar, discontinuous Galerkin) methods, h - and p -multigrid methods, finite element exterior calculus, numerical simulation and mathematical modeling in electromagnetism and fluid dynamics, scientific computing and software development for industrial applications.

Professional Career

- 6-month delegations : C.N.R.S. (2004-2005), C.R.C.T. (2007-2008), C.N.R.S. (2010-2011).
- Sept. 2001 – today : Assistant professor in applied mathematics at the Lab. J. –A. Dieudonné, Dept. of mathematics, Université de Nice Sophia-Antipolis.
- Sept. 2004 – August 2009 : Associated researcher at INRIA (Institut National de la Recherche en Informatique et Automatique) Sophia-Antipolis, NACHOS team (Numerical modeling and high performance computing for evolution problems in Complex domains and Heterogeneous media), common project between INRIA and the lab. J.-A. Dieudonné (UMR 6621).
- Sept. 2000 – august 2001 : Assistant professor in applied mathematics at the Université de Paris VI.
- Sept. 1997 – august 2000 : PhD student in Applied Mathematics with a contract by CNRS (Centre National de la Recherche Scientifique en France) at the ASCI (Applications Scientifiques et Calcul Intensif) lab., Gif-Sur-Yvette.
- May 1995 – August 1997 : Junior Researcher in Applied Mathematics at the CRS4 (Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna, Italy).

PhD student supervision

- Hassan Fahs, supervised with Stéphane Lanteri at INRIA Sophia-Antipolis, between sept 2005–dec 2008 on the subject : “Méthodes de type Galerkin discontinu d’ordre élevé pour la résolution numérique des équations de Maxwell stationnaires sur des maillages simpliciaux non-conformes” (fellowship from the Ministère de l’Enseignement Supérieur et de la Recherche and from France Telecom R&D, La Turbie).
- Laura Lazar, supervised with Richard Pasquetti at the Univ. of Nice, since sept 2007 on the subject “Méthode d’éléments finis d’ordre élevé pour les équations de Navier-Stokes” (fellowship from CNRS and Région PACA).
- Ilario Mazzieri, supervised with Alfio Quarteroni at the Mox lab. in the Polytechnical School of Milan, since sept. 2009 on the subject : “Non-conforming methods for elastodynamic problems” (fellowship by the Polytechnical School of Milan).

Expertise

- Reviewer for the following journals : M2AN, SIAM J. on Num. Anal., SIAM J. on Sci. Comput., Numer. Math., EPJ, J. of Comput. Phys., J. of Sci. Comput., CRAS Serie I.
- Editorial board for the following conferences : Numelec 2008 (Liège, Belgium), ESCO 2008 (Jetrchovice, Czech Republic), Compumag 2009 (Miami, US), ICOSAHOM 2009 (Trondheim, Norway), CEM 2011 (Wroclaw, Poland).
- Examiner for the following PhD students :
 - Yacoub Ould Agha, Institut Fresnel UMR 6133 de Marseille, September 2007.
 - Giacomo Ferrandi, Lab. Mox, Polytechnical School in Milan, may 2009.
 - Hamad Hazim, Univ. of Nice, July 2010.
 - Jamil Satouri, Paris VI Univ., October 2010.
 - Cédric Doucet, Université de Grenoble I, November 2010.

Distinctions

- Sept 2001 – today : awarded of the P.E.D.R. (Prime d'Encadrement et De Recherche univ.), then of the P.E.S. (Prime d'Excellence Scientifique)
- Feb. 2009 : qualified able to cover professor positions by the French National Committee of Univ.

Grants and contracts

- 2-year contract with Telecom Italia between 1995 and 1997 : "Decimetric radiowave propagation in urban areas : development of software tools", when I was junior researcher at the CRS4 center.
- 3-year Pierre et Marie Curie fellowship (TMR ERB4001GT965424) from the European Community between 1997 and 2000 : "Approximation of Maxwell equations by numerical methods on non-matching grids", for the PhD in Paris.
- 1-year PEPS fellowship from CNRS to promote Math-Industry Interaction, between 2009 and 2010 : "Numerical simulation of electromagnetic phenomena in moving industrial devices by a non-conforming mortar mixed finite element approach in 3D". Collaboration with the Belgian software house Open Engineering S.A., to include the mortar approach in their C++ product Oofelie.

Administration

- Sept. 2002 – August 2008 : Member of the selection comity for assistant professors in the Univ. of Nice, specialty : applied mathematics and scientific computing.
- Sept. 2006 – August 2009 : Member of the Faculty Consil at the Univ. of Nice.
- Sept. 2009 – today : responsible for Master 1 IMEA diploma (Ingénierie Mathématique et Economie Appliquée, ex. MASS) at the Univ. of Nice.

Organization of scientific events

- Workshop for the *PDEs and Numerical Analysis* team of the Lab. J.-A. Dieudonné, Univ. of Nice, on the lake of Como (Italie), from 22 to 26 September 2003.
- Meetings on computational electromagnetism, from 14 to 15 June 2002 at the Univ. of Nice, and 7 march 2003, at the Lab. Jacques-Louis Lions. Round table with researchers from the KTH (Stockholm) and the INRIA (Sophia-Antipolis, Rocquencourt).
- Minisymposia at the AMAM conference :
 - [1] *Questions of algebraic topology in numerical analysis : algorithmics and applications*. Participants : Alain Bossavit (LGEP, Paris), Annalisa Buffa (IMATI, Pavie, Italie), Patrick Dular (Université de Liège, Belgique), Isabelle Terrasse (EADS Company, Paris, France), and myself.
 - [2] *High-order numerical methods*. Participants : Yvon Maday (Paris 6), Serge Kraeutle (Erlangen University), Daniele Funaro (Université di Modena), Xavier Vasseur (ETH Zurich), Remi Abgrall (Université de Bordeaux).
- Theoretical and practical exercises on the mortar element method, at the Ecole d'Eté CEA-EDF-INRIA, subject : "Numerical methods for couplings in multi-physics", from the 14 to the 25 June 2004, at the Centre de Séminaires Port-Royal, Saint-Lambert des Bois (78) close to Paris.

- In the frame of the “séminaire de l'équipe EDP-Analyse Numérique”, I organized on November 18th, at the Laboratoire J. A. Dieudonné, an “informal” meeting between mathematicians and industrial people, namely M. Constant Mazeran (from ACRI) who presented “Couleur de l'Océan : principe, applications, besoins mathématiques”, and M. Luca Ghezzi (from ABB) who talked about “Modeling and Simulation of Low Voltage Arcs : the Computational Magnetohydrodynamic Approach”.

Known foreign languages

- Italian, mother tongue.
- English, very good level written and spoken (First certificate diploma from Cambridge in 1996, and Advanced Certificate diploma from Cambridge 1997).
- French, very good level written and spoken (living and working in France since sept. 1997).

Computer skills

Operative systems : Windows, Linux, Unix

Scientific programming languages : Fortran 77, Fortran 90, Scilab, Matlab

Word processing tools : Latex, MS Office, Open Office, HTML

Investigated topics and numerical methods

- Modeling of physical phenomena :
academic and industrial applications mainly in electromagnetism, fluid dynamics and elasticity.
- Considered equations :
Maxwell's equations and their Galilean limits, Stokes and Navier-Stokes equations, elastodynamic equations.
- High-order variational Galerkin methods :
 h -, p -, hp -finite element methods on unstructured grids,
Gauss-Lobatto-Legendre spectral element methods on hexahedral grids,
Gauss-Fekete spectral element methods on simplicial grids,
 h -, p -, hp -mixed Whitney finite element methods on simplicial grids.
These methods are coupled to high-order finite difference schemes to treat time dependent equations.
- Non-conforming domain decomposition methods :
mortar element method for non-overlapping and overlapping sub-domains,
discontinuous Galerkin method for non-overlapping sub-domains.
- Conforming domain decomposition preconditioners :
overlapping Schwarz methods and Neumann Neumann Schur complement methods.
- Multilevel solvers :
 p -multigrid method for Fekete spectral elements,
 h -multigrid method for mixed Whitney finite elements.
- Discrete differential exterior calculus tools in scientific computing :
numerical resolution of low frequency electromagnetic problems,
numerical representation of divergence free or curl free vector potentials in topologically nontrivial domains,
numerical computation of homology group generators, applications to mesh defect detection.
- Grid generation and adaptation :
Principal concepts on isotropic/anisotropic grid generation and adaption methods, local mesh refinement, mesh deformation, structured and unstructured grids. I worked on this subject at the CRS4.
- Code development : I wrote several software codes from scratch (counting up to 6500 lines) in Fortran 77 and/or Fortran 90, as well as helped modifying industrial ones (such as Oofelie in C++, Geoelse in Fortran). All considered numerical methods have been implemented and tested in terms of precision, flexibility and performances. I consider the implementation of a numerical method as a determinant step towards its understanding.

Teaching activities

Teaching service in France consists in 192 hours/year, distributed among theoretical lessons (cours), black-board exercises (Travaux Dirigés), computer exercises (Travaux Pratiques) in Fortran or Scilab, and supervision of short projects by master students.

DEA, Diplôme d'Etudes Supérieures

Master MASS, Master in Mathématiques Appliquées et Sciences Sociales

ESSI, now EPU, Ecole Polytechnique Universitaire in Sophia-Antipolis

MP, mathématiques et physique, MI, mathématiques et informatique

Maths Mods, Erasmus Mundus MSc Course

Sept. 2000 – August 2001, **Université Pierre et Marie Curie (Paris VI)**

1st sem	Licence 3	TD/TP linear algebra	96
2nd sem	Licence 2	TD analysis	56
2nd sem	DEA of Numerical Analysis	distance learning	48

Sept. 2001 – today, **Université de Nice Sophia-Antipolis**

2001 to 2002	1st sem.	Master 1 MASS	cours on numerical analysis	39
	1st sem.	Master 1 MASS	TD on numerical analysis	38
	1st sem.	Licence 3 MASS	TD on data analysis	52
	2nd sem.	Licence 2 MI MP	TD on linear algebra	39
	2nd sem.	ESSI2	TD, TP on finite elements	40
2002 to 2003	1st sem.	Master 1 MASS	cours on numerical analysis	39
	1st sem.	Master 1 MASS	TD on numerical analysis	26
	1st sem.	Licence 3 MASS	TD on data analysis	52
	2nd sem.	ESSI2	cours, TD, TP on finite elements	50
2003 to 2004	1st sem.	Master 1 MASS	cours on numerical analysis	30
	1st sem.	Master 1 MASS	TD on numerical analysis	20
	1st sem.	Licence 3 MASS	TD on data analysis	58
	2nd sem.	Licence 2 MI MP	TD on numerical analysis	39
2004 to 2005	1st sem.	research break		
	2nd sem.	maternity break		
2005 to 2006	1st sem.	Master 1 MASS	cours on numerical analysis	27
	1st sem.	Master 1 MASS	TD on numerical analysis	20
	1st sem.	Master 1 MATH	TD on numerical analysis	36
	2nd sem.	Licence 2 MATH	cours on numerical methods	18
	2nd sem.	Licence 2 MATH	TP on numerical methods	16
	2nd sem.	Master 1 MASS	TD on optimization	20
	2nd sem.	Master 2 Calcul Scientifique	cours "Introduction to computational electromagnetism"	30
2006 to 2007	1st sem.	Master 1 MASS	TD on numerical analysis	20
	2nd sem.	maternity break		
2007 to 2008	1st sem.	Master 1 MASS	TD on numerical analysis	40
	1st sem.	Master 1 MASS	cours on numerical analysis	30
	2nd sem.	research break		
2008 to 2009	1st sem.	Master 1 MASS	TD, TP on numerical analysis	63
	1st sem.	Master 1 MASS	cours on numerical analysis	36
	2nd sem.	Master 2 Calcul Scientifique	cours, TD, TP on finite elements	45
	2nd sem.	Licence 1 MATH	TD on linear algebra	36
2009 to 2010	1st sem.	Master 1 MASS	TD, TP on numerical analysis	40
	1st sem.	Master 1 MASS	cours on numerical analysis	36
	2nd sem.	Master 2 Calcul Scientifique	cours, TD, TP on finite elements	45
	2nd sem.	Master 1 Math Mods	cours, TD, TP on finite elements	50

Book

- [1] C. BERNARDI, Y. MADAY, F. RAPETTI, *Discrétisations variationnelles de problèmes aux limites elliptiques*, Mathématiques & Applications, Vol. 45, n. ISBN-3-540-21369-4, Springer-Verlag, May 2004.

Papers

- [2] F. Rapetti, *Finite element approximation of elasto-dynamic problems in unbounded domains*, East-West Journal of Numerical Mathematics, Vol. 3, No. 4, pp. 255-279, 1996.
- [3] L. Pisani, F. Rapetti, C. Vittoli, *A Kirchhoff integral approach for decimetric radiowave propagation in urban areas*, ACES (Appl. Comp. Electromagnetics Soc.) Journal, Vol. 13, No. 1, pp. 63-70, 1998.
- [4] F. Rapetti, L. Santandrea, F. Bouillault, A. Razek, *Calculation of eddy currents in moving structures using a finite element method on non-matching grids*, COMPEL (Int. J. for Comp. and Math. in Electric and Electronic Eng.), Vol. 19, No. 1, pp. 10-19, 2000.
- [5] A. Buffa, Y. Maday, F. Rapetti, *A sliding mesh-mortar method for a two dimensional eddy currents model of electric engines*, Méth. Math. en Anal. Num., Vol. 35, No. 2, pp. 191-228, 2001.
- [6] F. Rapetti, A. Buffa, F. Bouillault, Y. Maday, *Simulation of a coupled magneto-mechanical system through the sliding-mesh mortar element method*, COMPEL (Int. J. for Comp. and Math. in Electric and Electronic Eng.), Vol. 19, No. 2, pp. 332-340, 2000.
- [7] L. Formaggia, C. Manzi, F. Rapetti, *Function approximation on triangular grids : some numerical results using adaptive techniques*, Appl. Num. Math., Vol. 32, No. 4, pp. 389-399, 2000.
- [8] F. Rapetti, A. Toselli, *A FETI preconditioner for two dimensional edge element approximations of Maxwell equations on non-matching grids*, SIAM J. on Scient. Comp., Vol. 23, No. 1, pp. 92-108, 2001.
- [9] A. Buffa, Y. Maday, F. Rapetti, *Calculation of eddy currents in moving structures by a sliding mesh-finite element method*, IEEE Transactions on Magnetics, Vol. 36, No. 4, pp. 1356-1359, 2000.
- [10] F. Rapetti, F. Bouillault, L. Santandrea, A. Buffa, Y. Maday, A. Razek, *Calculation of eddy currents with edge elements on non-matching grids in moving structures*, IEEE Transactions on Magnetics, Vol. 36, No. 4, pp. 1351-1355, 2000.
- [11] A. Buffa, Y. Maday, F. Rapetti, *An electromagnetic damping machine : model, analysis and numerics*, Boll. Unione Matematica Italiana, Sez. B Artic. Ric. Mat. Vol. (8) 4, No. 1, pp. 121-129, 2001.
- [12] F. Rapetti, *The mortar edge element method on non-matching grids for eddy current calculations in moving structures*, Int. J. Num. Meth. in Engng., Vol. 14, No. 6, pp. 457-477, 2001.
- [13] F. Bouillault, A. Buffa, Y. Maday, F. Rapetti, *Simulation of a magneto-mechanical damping machine : analysis, discretization and results*, Computer Methods in Appl. Mech. and Engng., Vol. 191, No. 23-24, pp. 2587-2610, 2002.
- [14] F. Bouillault, A. Buffa, Y. Maday, F. Rapetti, *The mortar edge element method in three dimensions : application to magnetostatics*, SIAM J. on Scient. Comp., Vol. 24, No. 4, pp. 1303-1327, 2002.
- [15] F. Rapetti, Y. Maday, F. Bouillault, A. Razek, *Eddy current calculations in three-dimensional moving structures*, IEEE Transactions on Magnetics, Vol. 38, No. 2, pp. 613-616, 2002.
- [16] F. Rapetti, F. Dubois, A. Bossavit, *Integer matrix factorization for mesh defects detection*, C. R. Acad. Sci. Paris, Ser. I 334, pp. 717-720, 2002.
- [17] Y. Maday, F. Rapetti, B. Wohlmuth, *Coupling between scalar and vector potentials by the mortar element method*, C. R. Acad. Sci. Paris, Ser. I 334, pp. 933-938, 2002.
- [18] F. Rapetti, F. Dubois, A. Bossavit, *Discrete vector potentials for non-simply connected three-dimensional domains*, SIAM J. on Numerical Analysis, Vol. 41, No. 4, pp. 1505-1527, 2003.

- [19] B. Flemisch, Y. Maday, F. Rapetti, B. Wohlmuth, *Coupling scalar and vector potentials on nonmatching grids for eddy currents in a moving conductor*, Journal of Computational and Applied Mathematics, Vol. 168, No. 1–2, pp. 191–205, 2004.
- [20] R. Pasquetti, F. Rapetti, *Spectral element methods on triangles and quadrilaterals : comparisons and applications*, Journal of Computational Physics, Vol. 198, No. 1, pp. 349–362, 2004.
- [21] B. Flemisch, Y. Maday, F. Rapetti, B. I. Wohlmuth, *Scalar and vector potentials' coupling on nonmatching grids for the simulation of an electromagnetic brake*, COMPEL (Int. J. for Comp. and Math. in Electric and Electronic Eng.), Vol. 24, No. 3, pp. 1061–1070, 2005.
- [22] A. Ben Abdallah, F. Ben Belgacem, Y. Maday, F. Rapetti, *Mortaring the two-dimensional edge elements for the discretization of some electromagnetic models*, Mathematical Models and Methods in Applied Sciences, Vol. 28, pp. 2007–2029, 2005.
- [23] A. Bossavit, F. Rapetti, *A prolongation/restriction operator for Whitney elements on simplicial meshes*, SIAM J. on Numerical Analysis, Vol. 43, No. 5, pp. 2077–2097, 2005.
- [24] O. J. Antunes, J.P.A. Bastos, N. Sadowski, A. Razek, L. Santandrea, F. Bouillault, F. Rapetti, *Using hierarchic interpolation with mortar and moving band methods for electrical machines analysis*, IEEE Transactions on Magnetics, Vol. 41, No. 5, pp. 1472–1475, 2005.
- [25] R. Pasquetti, F. Rapetti, *Spectral element methods on unstructured meshes : comparisons and recent advances*, Journal of Scientific Computing, Vol. 27, No 1-3, pp. 377–387, 2006.
- [26] O. J. Antunes, J. P. A. Bastos, N. Sadowski, A. Razek, L. Santandrea, F. Bouillault, F. Rapetti, *Torque calculation with conforming and non-conforming movement interface*, IEEE Transactions on Magnetics, Vol. 42, No. 4, pp. 983–986, April 2006.
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- [28] C. Bernardi, Y. Maday, F. Rapetti, *Basics and some applications of the mortar element method*, GAMM – Gesellschaft für Angewandte Mathematik und Mechanik, Vol. 28, No. 2, pp. 97–123, 2005.
- [29] F. Ben Belgacem, C. Bernardi, F. Rapetti, *Numerical analysis of a model for an axisymmetric guide for electromagnetic waves. Part I : The Fourier analysis*, Mathematical Methods in the Applied Sciences, Vol. 28, pp. 2007–2029, 2005.
- [30] F. Rapetti, *Weight computation for simplicial Whitney forms of degree one*, C. R. Acad. Sci. Paris, Ser. I, 341, Issue 8, pp. 519–523, 2005.
- [31] G. Loeper, F. Rapetti, *Numerical resolution of the Monge-Ampère equation by a Newton's algorithm*, C. R. Acad. Sci. Paris, Ser. I 340, Issue 4, pp. 319–324, 2005.
- [32] A. Bossavit, F. Rapetti, *Geometrical localization of the degrees of freedom for Whitney elements of higher order*, IEE Sci. Meas. Technol., Vol. 1, No. 1, pp. 63–66, 2007.
- [33] R. Pasquetti, L. F. Pavarino, F. Rapetti, E. Zampieri, *Neumann-Neumann-Schur complement methods for Fekete spectral elements*, special issue on "Spectral Interpolation and Applications", Journal of Engineering Mathematics, Vol. 56, No. 3, pp. 323–335, 2006.
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- [35] F. Rapetti, *High order edge elements on simplicial meshes*, Méth. Math. en Anal. Num., Vol. 41, No. 6, pp. 1001-1020, 2007.
- [36] H. Fahs, L. Fezoui, S. Lanteri, F. Rapetti, *Preliminary investigation of non-conforming discontinuous Galerkin methods for solving the time domain Maxwell equations*, IEEE Trans. on Magn., Vol. 44, No. 6, pp. 1254-1257, 2008.
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- [39] F. Rapetti, A. Bossavit, *Whitney forms of higher degree*, SIAM J. on Numerical Analysis, Vol. 47, No. 3, pp. 2369-2386, 2009.
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- [42] F. Rapetti, G. Rousseaux, *Implications of Galilean electromagnetism in numerical modeling*, preprint (2010).

Referred proceedings

- [43] V. Dolean, R. Pasquetti, F. Rapetti, *p-Multigrid for Fekete spectral element method*, dans "Domain Decomposition in Science and Engineering XVII", U. Langer *et al.* eds., Lecture Notes in Computational Science and Engineering, Vol. 60, Springer-Verlag, pp. 485-492, 2007.
- [44] R. Pasquetti, L. F. Pavarino, F. Rapetti, E. Zampieri, *Overlapping Schwarz preconditioners for Fekete spectral elements*, dans "Domain Decomposition Methods in Science and Engineering XVI", Lecture Notes in Computational Science and Engineering, Vol. 55, pp. 717-724, Springer-Verlag, 2006.
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- [46] Y. Maday, F. Rapetti, B. I. Wohlmuth, *Mortar element coupling between global scalar and local vector potentials to solve eddy current problems*, dans "Numerical mathematics and advanced applications", Enumath 2001 proc., Brezzi F., Buffa A., Corsaro S., Murli A. eds., Springer-Verlag Italy (Milan) pp. 847-865, 2003.
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- [48] F. Rapetti *The mortar element method on non-matching grids for eddy currents modelling in moving conductors : an overview*, Simai proc., Cagliari, MS30, 2002.
- [49] M. Tafarguenit, L. Santandrea, F. Rapetti, F. Bouillault, M. Gabsi, *Two methods to take into account the movement within a finite element modelization of an electrical device*, European Symposium on Num. Meth. in Electromagn. (JEE) 2002, Toulouse, pp. 19-24.
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Research reports at CRS4 and INRIA

- [52] L. Formaggia, F. Rapetti, *MeSh2D (Unstructured Mesh Generator in 2D) (version 1.0), Algorithm Overview and Description*, rapport technique CRS4-TECH-REP-96/4, 1996.
- [53] L. Formaggia, F. Rapetti, *MeSh2D (Unstructured Mesh Generator in 2D), A User's Guide*, rapport technique CRS4-TECH-REP-96/6, 1996.
- [54] G. Fotia, L. Pisani, F. Rapetti, C. Vittoli, *Dimensionamento di Coperture Radioelettriche per Sistemi Microcellulari - Sviluppo di Strumenti di Calcolo I*, rapport technique CRS4-TECH-REP-96/56, 1996.
- [55] L. Pisani, F. Rapetti, C. Vittoli, *Dimensionamento di Coperture Radioelettriche per Sistemi Microcellulari - Sviluppo di Strumenti di Calcolo II*, rapport technique CRS4-TECH-REP-96/57, 1996.
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- [57] F. Rapetti, *Finite element analysis of scattering problems*, rapport technique CRS4-TECH-REP-97/23, 1997.
- [58] Y. Maday, F. Rapetti, *The mortar element method for variational approximations : basics, exercises and numerics*, support de cours, Ecole d'Eté CEA-EDF-INRIA sur les "Méthodes Numériques et Informatiques de couplage multi-physiques", du 14 au 25 juin 2004 au Centre de Séminaires Port-Royal à Saint-Lambert des Bois (78) en région parisienne.
- [59] H. Fahs, S. Lanteri, F. Rapetti, *Etude de stabilité d'une méthode Galerkin discontinu pour la résolution numérique des équations de Maxwell 2D en domaine temporel sur des maillages triangulaires non-conformes*, Rapport de recherche INRIA No. RR-6023, Nov. 2006.
- [60] H. Fahs, S. Lanteri, F. Rapetti, *A hp-like discontinuous Galerkin method for solving the 2D time-domain Maxwell's equations on non-conforming locally refined triangular meshes*, Rapport de recherche INRIA No. RR-6162, Feb. 2007.

Seminars and workshops

- ICIAM 1999, Edinburgh (talk : A sliding-mesh mortar element method to compute eddy current distributions in moving structures)
- DDM XIII, Lyon, 9-12/10/2000 (talk : An application to magnetostatics and magnetodynamics of the mortar edge element method in 3D)
- Workshop "Problems in Electromagnetism", Università degli Studi di Trento, November 29-30/11/02 (talk : Coupling scalar and vector potentials on non-matching grids for eddy currents in a moving conductor)
- AMAM, Nice, 10-13/2/03 (talk : Discrete vector potentials for non-simply connected 3D domains)
- COMPUMAG, Saratoga Springs (New York, US), 13-17/7/03 (talk : Scalar and vector potential coupling on non-matching grids for the simulation of an electromagnetic brake)
- XVII Congresso dell'UMI, Milan (Italie), 8-13/9/03 (talk : Smith normal form as an adequate tool to detect mesh defects as well as to build basis fields for domains with loops and holes)
- Workshop "Hybrid and multiscale methods for electromagnetic solvers", Stockholm 25-28/10/03 (talk : An introduction to the mortar element method and some related applications in electrostatics)
- Atelier "Elements Finis Vectoriels", ENSTA (Paris) 3/2/04 (talk : Discrete vector potentials for non-simply connected three-dimensional domains)

- Oberwolfach, 23-27/2/04 (talk : Smith normal form as an adequate tool to detect mesh defects as well as to build basis fields for domains with loops and holes)
- ICOSAHOM, Providence (US), 21-15/6/04 (talk : Spectral element methods on unstructured meshes : comparisons and recent advances)
- Colloque Franco-Canadien, Toulouse, 12-14/7/04 (talk : Coupling scalar and vector potentials on non-matching grids for eddy currents in a moving conductor)
- CEM 06, Aix-la-Chapelle, 4-6/4 (invited talk : Finite element discrétisations in electromagnetism)
- ACE 06, Boston (US), 4-6/5 (invited talk : Whitney forms and applications)
- ACOMEN 08, Liège (Belgique), 26-28/5 (talk : High order Whitney elements)
- ESCO 08, Jetrichovice (Czech Republic), 8-13/6 (talk : Overlapping mortar element method for eddy currents in moving conductors)
- Meeting European Women in Math, Amsterdam (Pays Bas), 13/7/2008 (invited talk : A spectral element method on triangles)
- IPOLFE seminar, Gent (Belgique), 15/12/2009 (invited talk : Finite element approaches for eddy current computations in moving conductors)
- ECCM, Paris (France), 16-21 may 2010 (talk : Implications of Galilean electromagnetism in numerical modeling)
- ICOSAHOM 2011, Tunis (Tunisia), 24-28/6/2011 (invited plenary talk : Spectral element methods on triangles)