

# Ruben Specogna, Ph.D.

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## Personal data

Place of birth . . . . . Cividale del Friuli (UD), Italy  
Date of birth . . . . . March 23rd, 1977

## Education

- **Università di Udine** Udine, Italy  
*Ph.D. in Industrial and Information Engineering* 2007  
– Advisor: Prof. Francesco Trevisan
- **Università di Udine** Udine, Italy  
*M.Sc. in Electronic Engineering* 2002  
– Advisors: Prof. Paolo Bettini, Prof. Francesco Trevisan

## Research positions

- **Università di Udine** Udine, Italy  
*Habilitation for Full Professor* 2020 – present
- **Università di Udine** Udine, Italy  
*Tenure as Associate Professor* 2016 – present  
– Courses taught:
  - \* Electrical Science (9 ECTS)
  - \* Electromagnetic Compatibility (6 ECTS)
  - \* Advanced simulation for the design of electrical devices (6 ECTS)
- **Università di Udine** Udine, Italy  
*Tenure as Assistant Professor* 2008 – 2016
- **Université de Liège** Liège, Belgium  
*Postdoc researcher* 2008  
– Advisors: prof. Patrick Dular and prof. Christophe Geuzaine, Applied and Computational Electromagnetics (ACE), Department of Electrical Engineering and Computer Science

## Editorships & Reviewer

- **Associate Editor** of the ISI international journal **Sensors**, whose impact factor is 3.6 according to 2020 Journal Citation Reports released by Thomson Reuters in 2021.  
*2019 – present*
- **Associate Editor** of the ISI international journal **International Journal of Applied Electromagnetics and Mechanics**, whose impact factor is 0.7 according to 2018 Journal Citation Reports released by Thomson Reuters in 2019.  
*2021 – present*
- **Associate Editor** of the ISI international journal **Mathematical Problems in Engineering**, whose impact factor is 1.0 according to 2013 Journal Citation Reports released by Thomson Reuters in 2014.  
*2014 – present*
- **Associate Editor** of the ISI international journal **Advances in Mathematical Physics**, whose impact factor is 0.94 according to 2018 Journal Citation Reports released by Thomson Reuters in 2019.  
*2018 – present*
- **Associate Editor** of the ISI international journal **e-Prime Advances in Electrical Engineering, Electronics and Energy**, Elsevier.  
*2022 – present*
- **Associate Editor** of the ISI international journal **Frontiers in Applied Mathematics and Statistics, Research Topic Numerical Analysis and Scientific Computation**, Frontiers Media.  
*2022 – present*
- **Guest Editor** of the Special Issue *Electromagnetic Sensors for Biomedical Applications* of the ISI international journal **Sensors**.  
*2018 – present*
- Was part of the **Editorial Board** of the 8th Workshop on Advanced Computational Electromagnetics (ACE'13), held at the Centro Internazionale per la Ricerca Matematica (CIRM), Fondazione Bruno Kessler (FBK), Trento, Italy (see <http://www.science.unitn.it/ACE2013/>)  
*2013*
- Is part of the **Editorial Board** of the Conference on the Computation of Electromagnetic Fields (COMPUMAG) and IEEE Conference on Electromagnetic Field Computation (CEFC), the two biggest conferences about computational electromagnetics.  
*2008 – present*
- **Reviewer** for 21 journals: IEEE Transactions on Magnetics, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Microwave Theory and Techniques, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, COMPEL: The International Journal for Computation and Mathematics in Electrical and Electronic Engineering, European Physical Journal-Applied Physics (EPJ-AP), Sensors, Journal of Theoretical and Applied Physics, Mathematical Problems in Engineering, Journal of Discrete Mathematics, Journal of Computational Methods in Sciences and Engineering, Journal of Computational and Applied Mathematics, Annals of Mathematics and Artificial Intelligence, IEEE Access,

International Journal for Numerical Methods in Fluids, PLoS ONE, Computational Intelligence and Neuroscience, Journal of Sensors, Journal of Applied Mathematics and Journal of Computational Physics.

## Awards & Grants

- Since march 2021 is CEO of the University of Udine startup EMC Gems Srl. The startup is performing state of the art research and development on computational electromagnetics and applied electromagnetics. The 2022 revenue is more than 250,000 € euro. The main customers are Renesas Electcnics, Infineon, Melexis.
- From January 2017, more than 250,000 € have been gathered with industrial contracts (Integrated Devices Technology Inc., Google Inc., Renesas, Automotive Lighting, Zincocromatura, Bosch, Siemens, EMWorks, etc.) through the EMCLab led by prof. Specogna.  
*Jan 2017- Dec 2019*
- Competitive grant for a one month Visiting Professor position at the Dipartment of Mathematics of the Università di Trento, Trento, Italy.  
*May 2016*
- Agence national de la recherche (ANR) grant for two months Visiting Professor position at the Institut Montpelliérain Alexander Grothendieck of the Université de Montpellier, Montpellier, France.  
*March 2016*
- Centre national de la recherche scientifique (CNRS) competitive grant for a three months Visiting Professor position at the Institut Montpelliérain Alexander Grothendieck of the Université de Montpellier, Montpellier, France.  
*March–June 2015*
- **Principal investigator** of the research project “Lab-on-a-chip device for point-of-care diagnostics of the thrombotic risk profile,” which has been funded with 30,000 € as a *Proof of Concept Network* (PoCN) by the Area Science Park of Trieste with the advocacy of the Italian Ministry of University and Research (MIUR).  
*February 2015*
- Competitive grant for a one month Visiting Professor position at the Centro Internazionale per la Ricerca Matematica (CIRM) of the Fondazione Bruno Kessler (FBK)–Università di Trento, Trento, Italy (see also <https://cirm.fbk.eu/list-visiting-professors-cirm-2008-2014>).  
*March 2013*
- **Principal investigator** of the research project “A novel system based on Electric Impedance Tomography (EIT) for *in vitro* imaging of haemostasis,” which has been funded with 139,570 € as a *Research Project of National Interest* (PRIN) by the Italian Ministry of University and Research (MIUR). It has also been cofunded with 15,000 € by University of Udine.  
*17 October 2011 – 17 October 2013*
- Founder of the IRONSCAN team which was selected as a winner at the business plan competition StartCup FVG, presenting a project about the three-dimensional imaging of rebars in concrete. The project won also the special price dedicated to prevention of damages due to heartquakes. The price consisted in 4,500 €.  
*2009*

- Postdoc Scholarship at Université de Liège, Liège, Belgium.  
*2008*
- Italian Ministry of University and Research (MIUR) Research Scholarship.  
*2007 and 2003*
- Best Poster prize at the Italian Meeting of Researchers in Electrical Engineering ET2006, Turin, Italy.  
*2006*
- Italian Ministry of University and Research (MIUR) three years Ph.D. Scholarship.  
*2004 – 2006*

## Research activity

His research interests are computational science and scientific computing, computational electromagnetism with applications to biomedical engineering, inverse problems and imaging, multi-physics problems (MEMS, nanoelectronics), computational topology and topological data analysis for biomedical image processing, nuclear fusion reactors engineering and design, and lab-on-a-chip biosensors.

The subjects of the scientific activity may be summarized as follows:

1. Research and development of electromagnetic simulators:
  - 1.1 Development of new mass matrices (i.e. discrete Hodge operators) for meshes formed by tetrahedra, prisms, hexahedra or general polyhedra
  - 1.2 Development of new formulations for electromagnetic problems ranging from statics (electrostatics, stationary conduction, magnetostatics) to low frequency (eddy currents, electro-quasistatics) based on DGA
  - 1.3 Development of novel formulations for multi-physics problems to solving coupled problems (in particular, electrostatic-Schrodinger equation for nanoelectronics, electrostatic-elastostatics for MEMS devices, stationary conduction-Butler-Volmer equation for fuel cells modeling)
  - 1.4 Solution of problems of electromagnetic propagation both in time and in frequency domain
2. Topological data analysis
  - 2.1 Topological data analysis for biomedical image processing, image segmentation by using current flows, skeletonization and thinning
  - 2.2 Computational topology for computational electromagnetics, development of complementary formulations and novel efficient algorithms for finding the so-called “cuts” and “links” for the solution of static and quasi-static electromagnetic problems
3. Non destructive testing, inverse problems and imaging
  - 3.1 Detection of flaws in metals with efficient electromagnetic solvers and inverse problem solutions based on multi-frequency and on total variation regularization
  - 3.2 Imaging in lab-on-a-chip devices
  - 3.3 Biosensors and applications of electromagnetic simulation in biomedical engineering.
4. Optimization of electric devices (for example insulator spacers in the design of the neutral beam injector (NBI) of ITER), magnetic devices (position sensors, wireless power transfer systems, etc) and photonics (optimization of photonic crystals).

## Academic Visits

- **Tampere University of Technology** Tampere, Finland  
*Department of Electrical Engineering, prof. Lauri Kettunen* Mar–Jul, 2005
- **Université de Liège** Liège, Belgium  
*Department of Electrical Engineering and Computer Science, prof. Patrick Dular* Nov, 2005
- **Boston University** Boston, MA, USA  
*Department of Electrical & Computer Engineering, prof. Robert P. Kotiuga* May–Jul, 2006
- **Jagiellonian University** Krakow, Poland  
*Department of Mathematics and Computer Science, prof. Marian Mrozek* Mar, 2009
- **Trento University** Trento, Italy  
*Department of Mathematics, prof. Alberto Valli* Jun, 2012
- **Fondazione Bruno Kessler (FBK) - CIRM Visiting Professor** Trento, Italy  
*Centro Internazionale per la Ricerca Matematica (CIRM), prof. Alberto Valli* Mar, 2013
- **Trento University** Trento, Italy  
*Department of Mathematics, prof. Alberto Valli* July, 2014
- **Montpellier University - CNRS Visiting Professor** Montpellier, France  
*Institut Montpellierain Alexander Grothendieck, prof. Daniele A. Di Pietro* Mar–Jun, 2015
- **Trento University** Trento, Italy  
*Department of Mathematics, prof. Ana Alonso* Jul, 2015
- **Trento University** Trento, Italy  
*Department of Mathematics, prof. Enrico Bertolazzi* Sep, 2015
- **Trento University** Trento, Italy  
*Department of Mathematics, prof. Riccardo Ghiloni* Feb, 2016
- **Technische Universität Darmstadt** Darmstadt, Germany  
*Institut für Theorie Elektromagnetischer Felder (TEMF), prof. De Gersem* Feb, 2016
- **Montpellier University - ANR Visiting Professor** Montpellier, France  
*Institut Montpellierain Alexander Grothendieck, prof. Daniele A. Di Pietro* Mar, 2016
- **Trento University** Trento, Italy  
*Department of Mathematics, prof. A. Alonso* May, 2016
- **Montpellier University** Montpellier, France  
*Institut Montpellierain Alexander Grothendieck, prof. Daniele A. Di Pietro* June, 2017
- **Trento University** Trento, Italy  
*Department of Mathematics, prof. R. Ghiloni* May, 2018

## Patents

- [PT1] A. Affanni, M. Cozzi, L. De Marco, M. Mazzucato, R. Specogna, F. Trevisan, *Metodo per l'analisi del processo di formazione di aggregati in un fluido biologico e relativa apparecchiatura di analisi*, Domanda di brevetto in Italia UD2012A000079 del 5/12/2012. Concesso il 5/11/2014 con numero 1411777. Esteso con domanda PCT WO2013164676 del 3/12/2013, *Method to analyze the cluster formation process in a biological fluid and corresponding analysis apparatus*. Nazionalizzato con domanda di brevetto europeo EP2845002 e concesso in data 13/07/2016; convalidato in Francia (F), Regno Unito (UK), Svizzera (CH) e Germania (D).

- [PT2] A. Affanni, M. Battiston, L. De Marco, M. Mazzucato, R. Specogna, F. Trevisan, *Apparecchiatura per l'analisi del processo di formazione di aggregati in un fluido biologico e relativo metodo di analisi*. Domanda di brevetto in Italia ITUD20130047 del 3/4/2013. Concesso il 31/7/2015 con numero 1417286. Esteso con domanda PCT WO2014162285 del 3/4/2014, *Apparatus for analyzing the process of formation of aggregates in a biological fluid and corresponding method of analysis*. Nazionalizzato con domanda di brevetto europeo EP2981818, pubblicata in data 10/02/2016 e con domanda di brevetto statunitense US2016047827, pubblicata in data 18/02/2016.
- [PT3] G. Qama, M. Passarotto, R. Specogna, *Position sensors coil optimization*, US20190128702A1, provisional patent 01/11/2017, filed 29/06/2018, granted on 02/05/2019.
- [PT4] S. Saggini, R. Specogna, Liyu Yang et al. *Novel Winding Technology to Reduce Wireless Charging Receiver Loss*, 2020.
- [PT5] M. Passarotto, S. Pitassi, R. Specogna, *Procedimento per calcolare grandezze fisiche di un corpo conduttivo, sistema di elaborazione e prodotto informatico corrispondenti*, 2021.
- [PT6] A. Hoxha, S. Pitassi, R. Specogna, *Biosensore e relativo procedimento*, 2021.
- [PT7] A. Hoxha, M. Passarotto, R. Specogna, *Procedimento di supporto alla progettazione e relativi apparato e programma*, 2021.
- [PT8] A. Hoxha, M. Passarotto, R. Specogna, *Procedimento per un sensore risonante, relativo apparato e sensore risonante*, 2021.
- [PT9] A. Hoxha, R. Specogna, *Sensore induttivo e relativi procedimenti di progettazione e d'uso*, 2022.

**Publications on ISI International Journals** (available at <http://www.comphys.com/papers.html>)

- The candidate has published **125 papers on international journals**, 8 of these papers are with a **single name**.
- The candidate has submitted **9 patents**.
- The total impact factor is 322.7.
- The relationship between the ASN 2020 indicators for area 09/E1 and the candidate's indicators are summarized in the following table:

	Numero articoli	Citazioni	h-index
I° fascia area 09/E1	21	379	11
Commissario area 09/E1	25	640	14
Ruben Specogna	85	1137	17
Rapporto con mediane I° fascia	4.0	3.0	1.5
Rapporto con mediane Commissario	3.4	1.8	1.2

- All contributions required by the 2004-2010 Research Quality Assessment (VQR) received a rating of 1 (excellent).
- In VQR 2015-2019, 4 papers were evaluated, 1 B (Excellent) and 3 C (Standard).

- The following indices have been computed:

Year	FPO associati	FSS associati	FPO tutti	FSS tutti
2011-2015	2/77	5/77	4/188	14/188
2012-2016	2/78	9/78	2/185	20/185
2014-2018	2/75	14/75	3/185	44/185
2015-2019	3/81	30/81	7/185	69/185

- The papers have been published in the following journals:

Number of papers	Journal	Impact factor
1	IEEE Transactions on Image Processing	11.0
1	Nanoscae	8.3
5	Computer Methods in Applied Mechanics and Engineering	6.6
1	IEEE Transactions on Instrumentation and Measurement	5.3
1	Measurements	5.1
1	IEEE Transactions on Biomedical Engineering	4.8
2	IEEE Transactions on Antennas and Propagation	4.8
2	Computer Physics Communications	4.7
6	Journal of Computational Physics	4.6
1	IEEE Sensors Journal	4.3
2	Sensors	3.8
1	Plos ONE	3.8
2	SIAM Journal on Numerical Analysis	3.2
1	Communications in Computational Physics	3.2
3	International Journal for Numerical Methods in Engineering	3.0
1	Journal of applied physics	2.9
1	IEEE Transactions on Very Large Scale Integration (VLSI) Systems	2.8
2	IEEE Transactions on Dielectrics and Electrical insulation	2.5
1	IEEE Journal of the Electron Devices Society	2.5
1	Inverse problems	2.4
1	Nondestructive testing and evaluation	2.1
4	CMES: Computer Modeling in Engineering Sciences	2.0
1	IEEE Transactions on Electromagnetic Compatibility (EMC)	2.0
9	Fusion Engineering and Design	1.9
1	Journal of Computational Electronics	1.9
1	ESAIM: Mathematical Modelling And Numerical Analysis	1.9
65	IEEE Transactions on Magnetics	1.8
1	Mathematical Problems in Engineering	1.6
1	IEEE Transactions on Plasma Science	1.4
3	European Physical Journal – Applied physics	1.2
1	Journal of applied physics	0.8
1	COMPEL.	0.8
1	International Journal of Applied Electromagnetics and Mechanics	0.5

[J1] A. Hoxha, R. Specogna, *Study and design of ratiometric inductive position sensors using area-of-overlap functions*, IEEE Sensor Journal, 2022, in press, regular paper.

[J2] S. Pitassi, R. Ghiloni, R. Specogna, *Inverting the discrete curl operator: a novel graph algorithm to find a vector potential of a given vector field*, Journal of Computational Physics, 2022, in press, regular paper.

- [J3] A. Hoxha, M. Passarotto, G. Qama, R. Specogna, *Design optimization of PCB-based rotary inductive position sensors*, Sensors, 2022, in press, regular paper.
- [J4] A. Hoxha, M. Passarotto, R. Specogna, *Fast computation of eddy currents for multiple conductors*, IEEE Transactions on Magnetics, 2022, in press.
- [J5] M. Passarotto, S. Pitassi, R. Specogna, *Foundations of volume integral methods for eddy current problems*, Computer Methods in Applied Mechanics and Engineering, Vol. 392, 114626, 2022, regular paper.
- [J6] R. Fontanini, M. Segatto, M. Massarotto, R. Specogna, F. Driussi, M. Loghi, Member, David Esseni, *Modelling and design of FTJs as multi-level low energy memristors for neuromorphic computing*, IEEE Journal of the Electron Devices Society, vol. 9, pp. 1202-1209, 2021, regular paper.
- [J7] D. Voltolina, R. Torchio, P. Bettini, R. Specogna, P. Alotto, *Optimized Cycle Basis in Volume Integral Formulations for Large Scale Eddy-Current Problems*, Computer Physics Communications, Vol. 265, 108004, 2021, regular paper.
- [J8] S. Pitassi, R. Ghiloni, F. Trevisan, R. Specogna, *The role of the dual grid in low-order compatible numerical schemes on general meshes*, Journal of Computational Physics, Vol. 436, 110285, 2021, regular paper.
- [J9] S. Pitassi, R. Ghiloni, R. Specogna, *New magic formulas demonstration shows unexpected features of geometrically defined matrices for polyhedral grids*, IEEE Transactions on Magnetics, Vol. 57, No. 6, 7401904, 2021.
- [J10] M. Passarotto, D. Klis, O. Rain, R. Specogna, *Mirror Symmetry in Integral Formulations for Eddy Currents*, IEEE Transactions on Magnetics, Vol. 57, No. 6, 6301204, 2021.
- [J11] P. Bettini, G. Spizzo, D. Voltolina, L. Marrelli, M. Maraschek, V. Igochine, R. Specogna, ASDEX Upgrade Team, EUROfusion MST Team, *Interaction of Tearing Modes with Passive Structures in a Tokamak*, IEEE Transactions on Magnetics, Vol. 57, No. 6, 7200205, 2021.
- [J12] P. Bettini, L. Marrelli, D. Voltolina, R. Cavazzana, G. Marchiori, N. Marconato, R. Specogna, G. Spizzo, R. Torchio, P. Zanca, *Error Fields Computation in the RFX-mod2 Reversed Field Pinch*, IEEE Transactions on Magnetics, Vol. 57, No. 6, 8300804, 2021.
- [J13] S. Pitassi, F. Trevisan, R. Specogna, *Explicit geometric construction of sparse inverse mass matrices for arbitrary tetrahedral grids*, Computer Methods in Applied Mechanics and Engineering, Vol. 377, 113699, 2021.
- [J14] T. Rollo, F. Blanchini, G. Giordano, R. Specogna, D. Esseni, *Stabilization of negative capacitance in ferroelectric capacitors with and without a metal interlayer*, Nanoscale, Vol. 12, pp. 6121-6129, 2020.
- [J15] R. Specogna, *A novel mixed-hybrid formulation for magnetostatics*, IEEE Trans. Magn., Vol. 56, No. 1, 7514404, 2020.
- [J16] F. Bellina, R. Specogna, *Diagonal material matrices for arbitrary simplicial meshes for solving Poisson problems with one unknown per element*, IEEE Trans. Magn., Vol. 56, No. 1, 7509104, 2020.
- [J17] M. Passarotto, R. Specogna, *Cyclic Symmetry in Volume Integral Formulations for Eddy Currents: Cohomology Computation and Gauging*, IEEE Trans. Magn., Vol. 56, No. 1, 7507904, 2020.
- [J18] M. Passarotto, R. Specogna, C. Geuzaine, *Fast Iterative Schemes for the Solution of Eddy Current Problems Featuring Multiple Conductors by Integral Formulations*, IEEE Trans. Magn., Vol. 56, No. 1, 7510404, 2020.



- [J19] L. Codecasa, B. Kapidani, R. Specogna, *The Time Domain Cell Method is a Coupling of Two Explicit Discontinuous Galerkin Schemes with Continuous Fluxes*, IEEE Trans. Magn., Vol. 56, No. 1, 7504404, 2020.
- [J20] P. Dlotko, B. Kapidani, S. Pitassi, R. Specogna *Fake conductivity or cohomology: Which to use when solving eddy current problems with h-formulations?*, IEEE Transactions on Magnetism, Vol. 55, No. 6, 7204104, 2019.
- [J21] L. Marrelli, G. Marchiori, P. Bettini, R. Cavazzana, B. Kapidani, L. Grando, N. Marconato, R. Specogna, D. Voltolina *Optimization of RFX-mod2 gap configuration by estimating the magnetic error fields due to the passive structure currents*, Fusion Engineering and Design, Vol. 146, Part A, pp. 680-683, 2019.
- [J22] M. Passarotto, R. Specogna, F. Trevisan *Novel geometrically defined mass matrices for tetrahedral meshes*, IEEE Transactions on Magnetism, Vol. 55, No. 6, 7200904, 2019.
- [J23] B. Kapidani, M. Passarotto, R. Specogna *Exploiting cyclic symmetry in stream function based boundary integral formulations*, IEEE Transactions on Magnetism, Vol. 55, No. 6, 7200504, 2019.
- [J24] A. Affanni, R. Specogna, F. Trevisan *Estimating the volume of unknown inclusions in an electrically conducting body with voltage measurements*, Sensors, Vol. 19, 637, 2019, regular paper.
- [J25] L. Codecasa, B. Kapidani, R. Specogna, F. Trevisan *Novel FDTD Technique over Tetrahedral Grids for Conductive Media*, IEEE Transactions on Antennas and Propagation, Vol. 66, No. 10, pp. 5387-5396, 2018, regular paper.
- [J26] A. Alonso Rodriguez, E. Bertolazzi, R. Ghiloni, R. Specogna, *Efficient construction of 2-chains representing a basis of  $H_2(\Omega, \partial\Omega; \mathbb{Z})$* , Advances in Computational Mathematics, DOI: 10.1007/s10444-018-9588-6, preprint available on arXiv, in press, 2018.
- [J27] N. Pilan, A. Kojima, R. Nishikiori, M. Ichikawa, J. Hiratsuka, R. Specogna, A. De Lorenzi, M. Bernardi, L. Lotto, P. Bettini, M. Kashiwagi, *Numerical-experimental benchmarking of a probabilistic code for prediction of Voltage Holding in High Vacuum*, IEEE Transactions on Plasma Science, Vol. 46, No. 5, pp. 1580-1586, 2018.
- [J28] A. Khebir, P. Dlotko, B. Kapidani, A. Kouki, R. Specogna, *T- $\Omega$  formulation with higher order hierarchical basis functions for non simply connected conductors*, Mathematical Problems in Engineering, Vol. 2018, 8308643, 2018.
- [J29] P. Bettini, M. Passarotto, R. Specogna, *Iterative solution of eddy current problems on polyhedral meshes*, IEEE Transactions on Magnetism, Vol. 54, No. 3, 7202304, 2018.
- [J30] P. Bettini, N. Pilan, N. Marconato, R. Specogna, *Goal-oriented adaptivity for voltage breakdown prediction*, IEEE Transactions on Magnetism, Vol. 54, No. 3, 7202404, 2018.
- [J31] M. Cicuttin, L. Codecasa, B. Kapidani, R. Specogna, F. Trevisan, *GPU accelerated time domain discrete geometric approach method for Maxwell's equations on tetrahedral grids*, IEEE Transactions on Magnetism, Vol. 54, No. 3, 7203004, 2018.
- [J32] P. Dlotko, B. Kapidani, R. Specogna, *Lean cohomology computation for electromagnetic modeling*, IEEE Transactions on Magnetism, Vol. 54, No. 3, 7400404, 2018.
- [J33] P. Bettini, M. Passarotto, R. Specogna, *Coupling volume and surface integral formulations for eddy currents*, IEEE Transactions on Magnetism, Vol. 54, No. 3, 7203604, 2018.

- [J34] N. Marconato, A. De Lorenzi, N. Pilan, P. Bettini, R. Specogna, A. Lawall, N. Wenzel, *Prediction of Lightning Impulse Voltage Induced Breakdown in Vacuum Interrupters*, IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 24, No. 6, pp. 3367-3373, 2017, regular paper.
- [J35] P. Bettini, P. Alotto, R. Cavazzana, L. Grando, G. Marchiori, L. Marrelli, R. Specogna, P. Zanca, *3D electromagnetic analysis of the MHD control system in RFX-mod upgrade*, Fusion Engineering and Design, Vol. 123, pp. 612-615, 2017.
- [J36] P. Bettini, C. Finotti, L. Grando, G. Marchiori, R. Specogna, *Modeling of the magnetic field errors of RFX-mod upgrade*, Fusion Engineering and Design, Vol. 123, pp. 518-521, 2017.
- [J37] D. De Zanet, M. Battiston, E. Lombardi, R. Specogna, F. Trevisan, L. De Marco, A. Affanni, M. Mazzucato, *Impedance biosensor for real-time monitoring and prediction of thrombotic individual profile in flowing blood*, PLoS ONE, Vol. 12, No. 9, e0184941, 2017.
- [J38] O. Badami, D. Lizzit, R. Specogna, D. Esseni, *Improved surface-roughness scattering and mobility models for multi-gate FETs with arbitrary cross-section and biasing scheme*, Journal of Applied Physics, Vol. 121, 245301, 2017, regular paper.
- [J39] A. Alonso Rodriguez, E. Bertolazzi, R. Ghiloni, R. Specogna, *Efficient construction of 2-chains with a prescribed boundary*, SIAM Journal on Numerical Analysis (SINUM), Vol. 55, No. 3, pp. 1159-1187, 2017 regular paper.
- [J40] M. Cicuttin, L. Codecasa, R. Specogna, F. Trevisan, *A geometric frequency-domain wave propagation formulation for fast convergence of iterative solvers*, IEEE Transactions on Magnetics, Vol. 53, No. 6, 7206404, 2017.
- [J41] D.A. Di Pietro, B. Kapidani, R. Specogna, F. Trevisan, *An arbitrary-order discontinuous skeletal method for solving electrostatics on general polyhedral meshes*, IEEE Transactions on Magnetics, Vol. 53, No. 6, 7402404, 2017.
- [J42] P. Bettini, M. Passarotto, R. Specogna, *A volume integral formulation for solving eddy current problems on polyhedral meshes*, IEEE Transactions on Magnetics, Vol. 53, No. 6, 7204904, 2017.
- [J43] P. Dlotko, B. Kapidani, R. Specogna, *Topoprocessor: an efficient computational topology toolbox for h-oriented eddy current formulations*, IEEE Transactions on Magnetics, Vol. 53, No. 6, 7204404, 2017.
- [J44] M. Cicuttin, R. Specogna, F. Trevisan, *Adaptivity based on the constitutive error for the Maxwell's eigenvalue problem on polyhedral meshes*, IEEE Transactions on Magnetics, Vol. 53, No. 6, 7201004, 2017.
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