



# Patricia Díaz de Alba

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## Personal information

Name **Patricia Díaz de Alba.**  
Nationality **Spanish.**  
Date of birth **20/05/1988.**  
Place of birth **San Fernando (Cádiz), Spain.**  
Gender **Female.**  
E-mail **patricia.diazda@unica.it.**  
Home page **<http://bugs.unica.it/~patricia/>.**

## Education

### Studies

- 20/04/2017 **PhD in Mathematics and Computer Science**, *University of Cagliari*, Cagliari (Italy).  
Thesis title: Numerical treatment for inverse problems in applied Geophysics.  
Supervisors: Prof. Giuseppe Rodriguez and Prof. Luisa Fermo
- 22/10/2012 **Master in Mathematics (Inter-university programme with the Universities of Cádiz, Málaga, Granada and Almería)**, *University of Cádiz*, Cádiz (Spain).  
Thesis title: Modelo de Gopalsamy-Ladas y el efecto Allee.  
Supervisor: Prof. Elena Medina.
- 25/07/2011 **Degree in Mathematics (5 years)**, *University of Cádiz*, Cádiz (Spain).

### Abroad experience

- 01/03/2020–  
16/03/2020 **Helmholtz Center – UFZ**, Leipzig, (Germany).  
Collaboration with Dr. Ulrike Werban and Dr. Edoardo Martini on EMI data inversion.  
The collaboration has been interrupted because of COVID19 emergency.
- 01/02/2016–  
26/04/2016 **Emory University**, Atlanta, (USA).  
Collaboration with Prof. James Nagy on inverse problems.
- 06/09/2009–  
28/02/2010 **Erasmus exchange students programme**, *University Joseph Fourier*, Grenoble (France).

### Participation to summer and training schools

1. **Summer School on Approximation and Quadrature for Applicative Integral Models**, Naples (Italy), June 10–13, 2025.
2. **Machine Learning Crash Course**, Genoa (Italy), June 27–July 1, 2022.
3. **Scientific School Advanced numerical techniques for inverse problems, with applications in imaging science and applied Geophysics**, Cagliari (Italy), July 17–21, 2017.
4. **Scientific Computing for X-Ray CT**, Copenhagen (Denmark), January 9–20, 2017.
5. **Exploiting Hidden Structure in Matrix Computations. Algorithms and Applications**, Cetraro (Italy), June 22–27, 2015.
6. **Computational Electromagnetism**, Cetraro (Italy), June, 9–14 2014.

### Languages

Spanish	<b>Mothertongue</b>
English	<b>Advance (B2 Certificate)</b>
Italian	<b>Advance (B2 Certificate)</b>
French	<b>Basic (A2 Certificate)</b>

### Computer skills

User	Linux, Microsoft Windows, OpenOffice, LaTeX and Cinderella. Basic knowledge of web design, Moodle.
Programming and calculation	MATLAB, Mathematica, FreeFem++ and wxMaxima.
Data analysis	Statgraphics.
Database	HeidiSQL.
Geomatics	gvSIG.

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### Academic positions

- 01/01/2025–  
present **Research fellow.**  
Research fellowship: “Mathematical methods for the collection of geophysical data”  
Research project: “MATH4CHARM A mathematical approach to inverse problems arising in cultural heritage preservation and dissemination”.  
Affiliation: Department of Mathematics and Computer Science, University of Cagliari, Cagliari (Italy).  
Responsible: Prof. Alessandro Buccini.
- 01/01/2022–  
31/12/2024 **Assistant Professor (Research project PON/INN).**  
Affiliation: Department of Mathematics, University of Salerno (Italy).  
Responsible: Prof. Beatrice Paternoster.
- 01/11/2020–  
31/12/2021 **Research fellow.**  
Research project: Project CUIM “Centre for Urban Informatics and Modeling”.  
Affiliation: Area of Mathematics, GSSI - Gran Sasso Science Institute, L’Aquila (Italy).  
Responsible: Prof. Nicola Guglielmi.

- 08/07/2019– **Research fellow.**  
 24/09/2020 Research fellowship: Inverse problems in imaging science with applications in Applied Geophysics.  
 Research project: Algoritmi e Modelli per l'Imaging Science (AMIS).  
 Affiliation: Department of Mathematics and Computer Science, University of Cagliari, Cagliari (Italy).  
 Responsible: Prof. Giuseppe Rodrguez.
- 07/11/2018– **Research fellow.**  
 07/05/2019 Research fellowship: Trattamento numerico di equazioni integrali connesse a problemi di Geofisica Applicata.  
 Research project: Algorithms for Approximation with applications [Acube].  
 Affiliation: Department of Mathematics and Computer Science, University of Cagliari, Cagliari (Italy).  
 Responsible: Prof. Luisa Fermo.
- 20/06/2017– **Research fellow.**  
 19/06/2018 Research fellowship: Permeabilità dinamica dei mezzi porosi, Full-waveform inversion di dati sismici e elettromagnetici, e inversione nonlineare di dati elettromagnetici.  
 Research project: Dynamic permeability of porous media, full-waveform inversion of seismic and electromagnetic data, and nonlinear inversion of electromagnetic data.  
 Affiliation: Department of Civil, Environmental Engineering and Architecture, University of Cagliari, Cagliari (Italy).  
 Responsible: Prof. Gian Piero Deidda.
- 07/2015– **Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna (CRS4)**, Santa  
 09/2015 Margherita di Pula, (Italy).  
 Collaboration to the parallelization of a calculation code for electromagnetic data inversion.

## Scientific activity

### Research interests

1. Inverse problems in Geoscience.
2. Regularization methods.
3. Ill-posed problems.
4. Numerical methods for integral, partial, and ordinary differential equations.

### Scientific and professional collaborations

- 01/05/2012– **Aguas de Cádiz, S.A.**, Cádiz (Spain).  
 27/09/2012 Modelling the water supply network of Cádiz, conducted by the Engines Department at University of Cádiz. (200 hours).
- 15/11/2011– **University of Cádiz**, Cádiz (Spain).  
 14/05/2012 Database management with MySQL for the diffusion of the Mathematics degree.

### Projects

- 2025 **Project INdAM–GNCS 2025.**  
 Research project: Tecniche numeriche per problemi di grandi dimensioni.  
 Responsible: Federica Pes.  
 Role: Participant.

- 2024-present **Project HPC-TRES.**  
Research project: Line E8 - Large scale imaging problems in Applied Geophysics.  
Responsible: Giuseppe Rodriguez.  
Role: Participant.
- 2024 **Project INdAM–GNCS 2024.**  
Research project: Algebra lineare numerica per problemi di grandi dimensioni: aspetti teorici e applicazioni.  
Role: Principal Investigator.
- 2023 **Project INdAM–GNCS 2023.**  
Research project: Metodi numerici per modelli descritti mediante operatori differenziali e integrali non locali.  
Responsible: Sabrina Francesca Pellegrino.  
Role: Participant.
- 2022 **Project INdAM–GNCS 2022.**  
Research project: Metodi e modelli di regolarizzazione per problemi mal posti di grandi dimensioni.  
Responsible: Alessandro Buccini.  
Role: Participant.
- 2020/2021 **Project INdAM–GNCS 2020/2021.**  
Research project: Tecniche numeriche per l'analisi delle reti complesse e lo studio dei problemi inversi.  
Responsible: Caterina Fenu.  
Role: Participant.
- 2019 **Project INdAM–GNCS 2019.**  
Research project: Discretizzazione di misure, approssimazione di operatori integrali ed applicazioni.  
Responsible: Donatella Occorsio.  
Role: Participant.
- 2019 **Regione Autonoma della Sardegna (RAS) Research Project.**  
Research project: Algoritmi e Modelli per l'Imaging Science (AMIS).  
Responsible: Giuseppe Rodriguez.  
Role: Participant.
- 2018 **Project INdAM–GNCS 2018.**  
Research project: Metodi di regolarizzazione non lineare: aspetti teorici, computazionali, applicativi.  
Responsible: Federico Benvenuto.  
Role: Participant.
- 2017 **Project INdAM–GNCS 2017.**  
Research project: Metodi numerici non lineari per problemi inversi e applicazioni.  
Responsible: Claudio Estatico.  
Role: Participant.
- 2016 **Project INdAM–GNCS 2016.**  
Reserach project: Inverse Problems in Geophysics (PING).  
Responsible: Giuseppe Rodriguez.  
Role: Participant.

### Organization of confereces and schools

1. **Calcolo Scientifico e Modelli Matematici: Alla ricerca delle cose nascoste attraverso le cose manifeste (CSMM 2026)**, Cagliari (Italy), February 18–20, 2026.  
Website: <https://bugs.unica.it/csmm2026/>
2. **Challenges and Advances in Numerical Analysis (CANA23)**, Cagliari (Italy), June 5–9, 2023.  
Website: <https://bugs.unica.it/cana23/>
3. **Recent Advances in Scientific Computation (ETNA25)**, Santa Margherita di Pula (Italy), May 27–29, 2019.  
Website: <http://bugs.unica.it/ETNA25/>
4. **International Workshop on Analysis and Numerical Approximation of Singular Problems IWANASP18**, Cagliari (Italy), September 4–6, 2018.  
Website: <http://bugs.unica.it/iwanasp18/>
5. **Scientific School Advanced numerical techniques for inverse problems, with applications in imaging science and applied Geophysics**, Cagliari (Italy), July 17–21, 2017.  
Website: <http://bugs.unica.it/cana/antip17/>

### Organization of conference sessions

1. **SIMAI 2025**, Trieste (Italy), September 1–5, 2025.  
IS019 - Linear and Nonlinear Inverse Problems and Their Applications
2. **GIMC SIMAI YOUNG 2024**, Naples (Italy), July 10–12, 2024.  
MS 10 - Computational approaches for integral and differential models: real-world applications

### Scientific communications

#### Invited

1. **SIMAI 2025**, Trieste (Italy), September 1–5, 2025.  
Landweber Iteration in Banach Spaces for Linear FDEM data inversion
2. **Third Meeting Gruppo di Attività ANA&A-SIMAI**, Salerno (Italy), May 15–16, 2025.  
FDEMtools: A Software package for Electromagnetic Induction Data Inversion in Geophysical Surveys
3. **International Conference Mathematics & Decision**, Rabat (Morocco), December 17–20, 2024.  
Linear FDEM subsoil data inversion in Banach spaces
4. **NAMAS-24: Numerical Analysis & Modelling in Applied Sciences**, Gaeta (Italy), September 16–20, 2024.  
A two-dimensional integral model of the first-kind for LIN electromagnetic data inversion
5. **SIAM Applied Linear Algebra (LA24)**, Paris (France), May 13–17, 2024.  
An Alternating Direction Multiplier Method for the inversion of FDEM data

6. **International Association for Mathematics and Computers in Simulation (IMACS2023)**, Roma (Italy), September 11–15, 2023.  
An efficient Gauss-Newton method for nonlinear inverse problems via generalized Krylov subspaces
7. **SIMAI 2023**, Matera (Italy), August 28th-September 1st, 2023.
  - 1) On the application of anti-Gauss cubature rules second-kind integral equations on the square
  - 2) Analytical and numerical preservation properties of a modified SIR model with contact matrix: application to the diffusion of information
8. **numerical aNalysis, porous media and waTer ResoUrceS: a fruitful cOntam-iNation (INTRUSION2023)**, Bari (Italy), July 3–5, 2023.  
Forward electromagnetic induction modelling in a multilayered half-space: An open-source software tool
9. **Challenges and Advances in Numerical Analysis (CANA23)**, Cagliari (Italy), June 5–9, 2023.  
On the numerical treatment of linear and nonlinear inverse problems in applied Geophysics
10. **Numerical Methods and New Technologies for Cultural Heritage, Philology and Industry 4.0 (NMT2023)**, Salerno (Italy), May 5, 2023.  
Numerical treatment of a SEIR model applied to the diffusion of fake news
11. **16th International Conference on Signal Image Technology & and Internet Based Systems (SITIS)**, Dijon (France), October 19–21, 2022.  
Influence of age group in the spreading of fake news: contact matrices in social media
12. **Conference Functional Analysis, Approximation Theory and Numerical Analysis (FAATNA)**, Matera (Italy), July 5–8, 2022.  
An averaged Nyström method for 2D Fredholm integral equations
13. **Numerical Methods for Large Scale Problems (NMLSP2022)**, Belgrade (Serbia), June 6–10, 2022.  
Identifying a conductive sphere by time-domain electromagnetic data via Prony-like methods
14. **SIAM Imaging Science (IS22)**, Berlin (Germany), March 21–25, 2022.  
Minimal-Norm Solution of an Overdetermined System of First Kind Integral Equations: Algorithms and Applications
15. **Numerical Methods and Scientific Computing**, Luminy (France), November 8–12, 2021.  
Numerical solution of second-kind integral equations by means of anti-Gauss quadrature rules
16. **International Conference on Computational Science and its Applications (ICCSA)**, Cagliari (Italy), September 13–16, 2021.  
Time domain electromagnetic response of a conductive and magnetic permeable sphere via exponential sums
17. **SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS21)**, Milan (Italy), June 21–24, 2021.  
2D Reconstruction of the Suboil by Electromagnetic Data Inversion
18. **SIAM Linear Algebra (LA21)**, New Orleans (LA), May 17–21, 2021.  
A variational nonlinear constrained model for the inversion of FDEM data

19. **SIMAI 2016**, Milan (Italy), September 13–16, 2016.  
Identifying the magnetic permeability in multi-frequency FDEM data inversion.

*Contributed*

1. **Software for Approximation (SA2025)**, Turin (Italy), February 4–7, 2025.  
A Software Tool for Electromagnetic Induction Data Inversion: FDEMtools for Geophysical Surveys
2. **I-CiTieS**, Salerno (Italy), September 13–15, 2023.  
Disinformation detection and diffusion analysis through epidemiological models
3. **International Conference on Computational Science and its Applications (ICCSA)**, Malaga (Spain), July 4–7, 2022.  
A modified SEIR model: stiffness analysis and application to the diffusion of fake news
4. **PRIMO Workshop 2021**, Bologna (Italy), October 11–13, 2021.  
Identifying a conductive and permeable sphere by exponential sums
5. **Mathematics for Nonstationary Signals and applications in Geophysics and other fields (NoSAG)**, L'Aquila (Italy), July 22–24, 2021.  
The minimal-norm RKHS solution of a system of first-kind integral equations in applied Geophysics
6. **International Congress on Industrial and Applied Mathematics (ICIAM2019)**, Valencia (Spain), July 15–19, 2019.  
A MATLAB package for EMI data inversion
7. **Recent Advances in Scientific Computation (ETNA25)**, Santa Margherita di Pula (Italy), May 27–29, 2019.  
A numerical method to solve integral equations by Gauss and anti-Gauss quadrature formulae.
8. **The International Conference Mathematical Modeling with Applications (M2A19)**, Rabat (Marocco), April 1–4, 2019.  
A MATLAB library for EM data inversion.
9. **Due giorni di Algebra Lineare Numerica**, Roma (Italy), February 18–19, 2019.  
Linear and nonlinear models for EMI data inversion.
10. **International Workshop on Analysis and Numerical Approximation of Singular Problems IWANASP18**, Cagliari (Italy), September 4–6, 2018.  
Recovering the electrical conductivity of the soil via a linear integral model.
11. **Numerical Analysis and Scientific Computation with Applications (NASCA18)**, Kalamata (Greece), July 2–6, 2018.  
Recovering the electrical conductivity of the soil via linear integral equations.
12. **Ninth International Conference “Inverse Problems: Modeling and Simulation” (IPMS 2018)**, Malta, May 21–25, 2018.  
A regularized Gauss-Newton algorithm for electromagnetic data inversion.
13. **International Workshop on Applied Mathematics & Quantum Information (AMQI 2016)**, Cagliari (Italy), November 3–4, 2016.  
Reconstructing the electrical conductivity and the magnetic permeability of the soil by a multi-frequency FDEM data inversion.

14. **21th International Conference Mathematical Modelling and Analysis (MMA 2016)**, Tartu (Estonia), June 1–4, 2016.  
Multi-frequency data inversion in Geophysical applications.
15. **Workshop DENIS**, Cagliari (Italy), November 30, 2015.  
Numerical processing of electromagnetic data in Geophysics.
16. **New Trends in Numerical Analysis (NETNA 2015)**, Falerna (Italy), June 18–21, 2015.  
An algorithm for data inversion in electromagnetic sounding.
17. **XXIV Congress on Differential Equations and Applications / XIV Congress on Applied Mathematics (CEDYA 2015)**, Cádiz (Spain), June 8–12, 2015.  
Regularized solution of a nonlinear problem in applied Geophysics.
18. **Two days in Applied Mathematics in Cagliari**, Cagliari (Italy), April 9–10, 2015.  
Numerical method for a nonlinear problem in applied Geophysics.

#### Posters

1. **Due Giorni di Algebra Lineare Numerica e Applicazioni**, Pisa (Italy), January 20–21, 2025.  
Linear FDEM data inversion via Landweber iterations in Banach spaces
2. **Calcolo Scientifico e modelli matematici alla ricerca delle cose nascoste attraverso le cose manifeste (CSMM 2024)**, Naples (Italy), January 29–31, 2024.  
Analytical properties of an age-group SIR model and their numerical preservation: application to social networks
3. **Partial Differential Equations in Analysis and Mathematical Physics**, Santa Margherita di Pula (Italy), May 30–June 1, 2019.  
Electromagnetic data inversion through a linear integral model: existence, uniqueness and numerical approximation of solutions
4. **Scientific School Advanced numerical techniques for inverse problems, with applications in imaging science and applied Geophysics**, Cagliari (Italy), July 17–21, 2017.  
Identifying the magnetic permeability in multi-frequency EM data inversion.
5. **Georgia Scientific Computing Symposium**, Atlanta (USA), February 20, 2016.  
Numerical method for data inversion in Geophysics.
6. **Workshop DENIS**, Cagliari (Italy), November 30, 2015.  
Numerical processing of electromagnetic data in Geophysics.

#### Funding

- 2022 **GNCS Research Grant for participation to schools, workshops, and conferences.**  
Responsible: Patricia Díaz de Alba
- 2020 **DAAD Research Grants - Short-Term Grants, 2020 (57507441).**  
Research project: Development of a geophysical inversion algorithm towards a constrained inversion of EMI data.  
Principal Investigator: Patricia Díaz de Alba

- 2019 **9th International Congress on Industrial and Applied Mathematics - ICIAM 2019 “Financial Support Program”**.  
Participation to the conference.  
Responsible: Patricia Díaz de Alba
- 2014 **INdAM–GNCS**.  
Participation to the Summer School “Computational Electromagnetism”, Cetraro (Italy)  
Responsible: Patricia Díaz de Alba
- 2014–2017 **University of Cagliari**.  
PhD grant (3 years)  
[Support activity](#)
- 2022-2024 **Member of Commissione di Orientamento**, Department of Mathematics, University of Salerno.
- 2024 **Giornata Futuro Remoto-Equilibri UNISA**, University of Salerno, Salerno (Italy), November 8, 2024.
- 2023 **XXXVII Edizione di Futuro Remoto-Equilibri**, Città della Scienza, Naples (Italy), November 20-26, 2023.
- 2023 **Giornata Futuro Remoto-Equilibri UNISA**, University of Salerno, Salerno (Italy), November 10, 2023.
- 2022 **XXXVI Edizione di Futuro Remoto-Equilibri**, Città della Scienza, Naples (Italy), November 22-27, 2022.  
[Editorial activity](#)
- Managing Editor **Electronic Transactions on Numerical analysis (ETNA)**, *Open access*, <https://etna.math.kent.edu/>.  
[Referee activity](#)
- Referee for **Inverse Problems · Journal of Computational and Applied Mathematics · Applied Numerical Mathematics · Computational and Applied Mathematics · BIT Numerical Mathematics · Electronic Transactions on Numerical Analysis · Mathematical Geosciences · Geomatics, Natural Hazards and Risk · Engineering with Computers · IEEE Transactions on Geosciences and Remote Sensing · International Journal of Remote Sensing · Springer Lecture Notes in Computer Science (LNCS) · International Journal of Remote Sensing and Remote Sensing Letters**.  
[Participation National groups](#)
- 2023-2024 **Member of Unione Matematica Italiana (UMI)** .
- 2023-present **Member of SIMAI (Società Italiana di Matematica Applicata e Industriale)**.
- 2020-present **Member of Research group “Post-graduate Researchers in Inverse problems, Machine learning, and Optimization” (PRIMO)**.
- 2015-present **Member of INdAM-GNCS (National Group for Scientific Computing of the National Institute for Advanced Mathematics, Italy)**.

## Theses direction experience

- 2017–2018 **Un'interfaccia grafica per l'inversione di dati EMI in geofisica applicata.**  
Author: Gabriele Lovicu.  
BSc Electronic and Electronical Engineering.  
Co-supervised with Prof. Giuseppe Rodriguez.
- 2014–2015 **Influenza delle caratteristiche magnetiche del terreno nell'electromagnetic sounding a bassa frequenza.**  
Author: Rita Delussu.  
BSc Electronic and Electronical Engineering.  
Co-supervised with Prof. Giuseppe Rodriguez.

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## Teaching

### PhD Course

- 2024/2025 **Técnicas de regularización de problemas inversos mal condicionados**, 10 hours, University of Cádiz (Spain).
- 2023/2024 **Regularization for ill-posed inverse problems**, 10 hours, University of Salerno (Italy).

### Co-Holder of BSc Courses

- 2023/2024 **Mathematical methods for Chemistry**, 32 hours, MATH-05/A - *Analisi numerica*, Bachelor's degree in Chemistry, University of Salerno (Italy).
- 2023/2024 **Laboratory of Programming and Calculus**, 28 hours, MATH-05/A - *Analisi numerica*, Bachelor's degree in Mathematics, University of Salerno (Italy).
- 2022/2023 **Mathematical methods for Chemistry**, 24 hours, MATH-05/A - *Analisi numerica*, Bachelor's degree in Chemistry, University of Salerno (Italy).
- 2022/2023 **Laboratory of Programming and Calculus**, 24 hours, MATH-05/A - *Analisi numerica*, Bachelor's degree in Mathematics, University of Salerno (Italy).
- 2021/2022 **Mathematical methods for Chemistry**, 24 hours, MATH-05/A - *Analisi numerica*, Bachelor's degree in Chemistry, University of Salerno (Italy).

### Teaching assistant

- 2019/2020 **Applied Mathematics**, 30 hours, MATH-05/A - *Analisi numerica*.  
for Bachelor's degree in Biomedical Engineering, University of Cagliari (Italy).
- 2018/2019 **Applied Mathematics**, 30 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Biomedical Engineering, University of Cagliari (Italy).
- 2016/2017 **Applied Mathematics**, 30 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Biomedical Engineering, University of Cagliari (Italy).
- 2015/2016 **Applied Mathematics**, 30 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Biomedical Engineering, University of Cagliari (Italy).
- 2014/2015 **Applied Mathematics**, 30 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Biomedical Engineering, University of Cagliari (Italy).

## E-learning teaching assistant

- 2019/2020 **Applied Mathematics**, 12 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Electrical and Electronic Engineering and Computer Science, University of Cagliari (Italy).
- 2018/2019 **Applied Mathematics**, 26 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Electrical and Electronic Engineering and Computer Science, University of Cagliari (Italy).
- 2017/2018 **Applied Mathematics**, 26 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Electrical and Electronic Engineering and Computer Science, University of Cagliari (Italy).
- 2016/2017 **Applied Mathematics**, 48 hours, MATH-05/A - *Analisi numerica*.  
Bachelor's degree in Electrical and Electronic Engineering and Computer Science, University of Cagliari, (Italy).

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## Publications

### PhD Thesis

- [1] P. Díaz de Alba  
*Numerical treatment for inverse problems in applied Geophysics*. PhD Thesis book, 2017. <http://bugs.unica.it/~gppe/did/tesi/17diazdealba>

### Papers

- [1] P. Díaz de Alba, L. Fermo and G. Rodriguez  
*AGquad: a Matlab package for 1D and 2D anti-Gauss type rules*. Journal of Approximation Software, 2025. To appear.
- [2] P. Díaz de Alba, L. Fermo and G. Rodriguez  
*Anti-Gauss cubature rules with applications to Fredholm integral equations on the square*. SIAM Journal of Scientific Computing, 47(2): A689–A712, 2025. DOI: 10.1137/24M1631432
- [3] P. Díaz de Alba, C. Estatico, M. Lazzaretti and G. Rodriguez  
*Linear FDEM subsoil data inversion in Banach spaces*. Electro. Trans. Numer. Anal., 61:173-195, 2024. DOI: 10.1553/etna\_vol61s173
- [4] P. Díaz de Alba and F. Pes  
*A two-dimensional integral model of the first-kind for LIN electromagnetic data inversion*. Electron. Trans. Numer. Anal., 61: 105-120, 2024. DOI: 10.1553/etna\_vol61s105
- [5] A. Buccini, P. Díaz de Alba, and F. Pes  
*An Alternating Direction Multiplier Method for the inversion of FDEM data*. J. Sci. Comput., 101(14), 2024. DOI: 10.1007/s10915-024-02652-9
- [6] A. Cardone, P. Díaz de Alba, and B. Paternoster  
*Analytical Properties and Numerical Preservation of an Age-Group Susceptible-Infected-Recovered Model: Application to the Diffusion of Information*. J. Comput. Nonlinear Dynam., 19(6): 061006, 2024. DOI: 10.1115/1.4065437

- [7] A. Buccini, P. Díaz de Alba, F. Pes, and L. Reichel  
*An efficient implementation of the Gauss-Newton method via generalized Krylov subspaces.* J. Sci. Comput., 97(2), 44, 2023. DOI: 10.1007/s10915-023-02360-w
- [8] G.P. Deidda, P. Díaz de Alba, F. Pes, and G. Rodriguez  
*Forward electromagnetic induction modelling in a multilayered half-space: An open-source software tool.* Remote Sens., 15(7), 1772, 2023. DOI: 10.3390/rs15071772
- [9] P. Díaz de Alba, L. Fermo, F. Pes, and G. Rodriguez  
*Regularized minimal-norm solution of an overdetermined system of first kind integral equations.* Numer. Algorithms, 92(1): 471-502, 2023. DOI: 10.1007/s11075-022-01282-2
- [10] A. Buccini and P. Díaz de Alba  
*A variational non-linear constrained model for the inversion of FDEM data.* Inverse Problems, 38(1): 014001, 2022. DOI: 10.1088/1361-6420/ac3c54
- [11] P. Díaz de Alba, L. Fermo, and G. Rodriguez  
*Solution of second-kind Fredholm integral equations by means of Gauss and anti-Gauss quadrature rules.* Numer. Math., 146(4): 699-728, 2020. DOI: 10.1007/s00211-020-01163-7
- [12] G.P. Deidda, P. Díaz de Alba, G. Rodriguez, and G. Vignoli  
*Inversion of multi-configuration complex EMI data with Minimum Gradient Support regularization. A case study.* Math. Geosci., 52(7): 945-970, 2020. DOI: 10.1007/s11004-020-09855-4
- [13] G. P. Deidda, P. Díaz de Alba, C. Fenu, Gabriele Lovicu, and G. Rodriguez  
*FDEMtools: a MATLAB package for FDEM data inversion.* Numer. Algorithms., 84(4): 1313–1327, 2020. DOI: 10.1007/s11075-019-00843-2
- [14] P. Díaz de Alba, L. Fermo, C. Van der Mee, and G. Rodriguez  
*Recovering the electrical conductivity of the soil via a linear integral model.* J. Comput. Appl. Math., 352:132-145, 2019. DOI: 10.1016/j.cam.2018.11.034
- [15] G.P. Deidda, P. Díaz de Alba and G. Rodriguez  
*Identifying the magnetic permeability in multi-frequency EM data inversion.* Electron. Trans. Numer. Anal., 47:1-17, 2017.

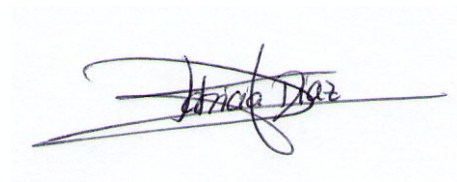
#### Book chapters

- [1] P. Díaz de Alba and G. Rodriguez  
*Regularized inversion of Multi-frequency EM Data in Geophysical Applications.* In F. Ortégón Gallego, M.V. Redondo Neble, and J.R. Rodríguez Galván, editors, Trends in Differential Equations and Applications, volume 8 of SEMA SIMAI Springer Series, pages 357-369. Springer, Switzerland, 2016. DOI: 10.1007/978-3-319-32013-7

#### Conference papers

- [1] A. Cardone, P. Díaz de Alba, and B. Paternoster

- Influence of age group in the spreading of fake news: contact matrices in social media.* 16th International Conference on Signal-Image Technology & Internet-Based Systems (SITIS), Dijon, France, 2022. DOI: 10.1109/SITIS57111.2022.00083
- [2] R. D'Ambrosio, P. Díaz de Alba, G. Giordano, and B. Paternoster  
*A modified SEIR model: stiffness analysis and application to the diffusion of fake news.* Lecture Notes in Computer Science in 22st International Conference on Computational Science and Its Applications (ICCSA), Malaga, Spain, July 2022. Vol 13375. Springer, Cham. DOI: 10.1007/978-3-031-10522-7\_7
- [3] G. P. Deidda, P. Díaz de Alba, L. Fermo, and G. Rodriguez  
*Time domain electromagnetic response of a conductive and magnetic permeable sphere via exponential sums.* In 21st International Conference on Computational Science and Its Applications (ICCSA), Cagliari, Italy, 13-16 Sept. 2021. DOI: 10.1109/ICCSA54496.2021.00020
- [4] P. Díaz de Alba, L. Fermo, F. Pes, and G. Rodriguez  
*Minimal-norm RKHS solution of an integral model in geo-electromagnetism.* . In 21st International Conference on Computational Science and Its Applications (ICCSA), Cagliari, Italy, 13-16 Sept. 2021. DOI: 10.1109/ICCSA54496.2021.00014
- [5] G.P. Deidda, P. Díaz de Alba, G. Rodriguez and G. Vignoli  
*Smooth and sparse inversion of EMI data from multi-configuration measurements.* IEEE Research and Technologies for Society and Industry (RTSI) 2018. ISBN: 978-1-5386-6282-3. DOI: 10.1109/RTSI.2018.8548416
- [6] P. Díaz de Alba and G. Rodriguez  
*Regularized solution of a nonlinear problem in applied Geophysics.* In J.M. Díaz Moreno, J.C. Díaz Moreno, C. García Vázquez, J. Medina Moreno, F. Ortegón Gallego, M.V. Pérez Martínez, C. Redondo Neble, and J.R. Rodríguez Galván, editors, Proceedings of the XXIV Congress on Differential Equations and Applications / XIV Congress on Applied Mathematics - Cádiz, June 8-12, 2015, pages 821-826, Cadiz, Spain, 2015. Editorial UCA. ISBN: 978-84-9828-527-7.



Cagliari (Italy), September 12, 2025