

Curriculum Vitae

Toufic El Arwadi

Born 22/11/1982 at Bologna, Italy

Nationality : Lebanese

Current position : Professor

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Google Scholar : <https://scholar.google.com/citations?user=jr11PTMAAAAJhl=froi=sra>

Address : Department of Mathematics and computer sciences

Faculty of Science,

Beirut Arab University,

P.O.Box : 11-5020, Beirut, Lebanon

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Education

2006 - 2010 Ph.D. in Mathematics

Title : *New approach of the D -bar method for the inverse conductivity problem*

Supervisors : Hassan Emamirad, Serge Huberson

Laboratory of Mathematics and applications (LMA), Poitiers, France

Degree : with highest honours

Referees : Habib Ammari and Marc Dambrine

2005 - 2006 Master 2 Mathematics, Paul Verlaine University, Metz, France

2003 - 2004 Master 1 Mathematics, San-Joseph university, Beirut, Lebanon

2002 - 2003 B.S. Mathematics, San Joseph University, Beirut, Lebanon

Scientific computer computations

Languages : Fortran 77 90, C, C++
others : Scilab, Freefem++, L^AT_EX, Gnuplot, MS office

Languages

Arabic : Basic language. French : Very good. English : very good. Italian :
Beginner

Teaching

- Undergraduate courses : Set theory, Linear Algebra, Probability and statistics, Numerical Analysis, Discrete Mathematics, Real Analysis I, Real Analysis II, Operation Research, Differential Geometry, Topology, Differential Calculus, Mathematical methods for physics, Financial mathematics, Business Mathematics, Advanced numerical analysis, Introduction to Calculus and Analytic geometry.
- Graduate courses : Advanced numerical analysis, Research topics, The finite element method, Numerical linear Algebra, Distributions theory, Evolution equations, Spectral theory, Measure and integration, Advanced analysis and applications.

Research Interest.

- Inverse problems
- Partial Differential Equations
- Numerical methods for integral and partial differential equations
- Control theory and hyperbolic systems
- Fixed point theory with applications
- Analysis of systems in fluid dynamics
- Water wave theory asymptotic models

Student Advising

- Rola Alayli (with Dr. A. El Zaart) Master thesis. (graduated 2013)
- Ali Kadhim (with Dr. Z. Khalil) Master thesis. (graduated 2014)
- Hoda Malak (with Dr. A. Tamasan) Master thesis. (graduated 2015)
- Alaa Al Sayed (with Dr. H. Chrayteh) Master thesis.(graduated 2016)
- Soltan Al Kontar (with Dr. H. Chrayteh) Ph.D thesis. (graduated 2017)
- Ali Ghoson (with Dr. A. Zaart) Master thesis. (graduated 2018)
- Nour Abou Jmeih (with Dr. H. Chrayteh) Master thesis.(graduated 2018)
- Marwa Itani (with Dr. E. Ashmawy) Master thesis.(graduated 2018)
- Mirna Fares (with Dr. E. Ashmawy) Master thesis.(graduated 2018)
- Rola Ahmad (with Dr. H. Chrayteh) Ph.D thesis.(graduated 2018)

- Mohamad Haidar (with Dr. S. Israwi) Ph.D thesis. (graduated 2020)
- Mohamad Hindi Master thesis.(graduated 2020)
- Sarah Slayi (with Dr. E. Ashmawy) Ph.D thesis. (graduated 2021)
- Moussa Bzeih (with Dr. A. Wehbe) Ph.D thesis.
- Marwa Birjawi (with Dr. S. Israwi) Ph.D thesis.
- Hamza Zougheib Ph.D thesis.

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| Publications |
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- T. El Arwadi *Méthode De D-bar Pour La Résolution Du Problème De Conductivité, Nouvelle Approche* (European University Edition)
- T. El Arwadi *Error estimates for reconstructed conductivities via the D-bar method*. Numerical Functional Analysis and Optimization ,Vol. 33, Iss. 1, 2012 ,pp 21-38
- M.A. Cherif and T. El Arwadi . *D-Bar Method for Smooth and Nonsmooth Conductivities* Numerical Functional Analysis and Optimization .Vol. 35, Iss. 2, 2014 ,pp 198-222
- M.A. Cherif, T. El Arwadi, H. Emamirad, J.M Sac Épée *The Dirichlet-to-Neumann semigroup acts as a magnifying glass* Semigroup Forum, Vol. 88, Iss. 3, 2014 ,pp 753-767
- T. El Arwadi, S. Dib, T. Sayah *A Priori and A Posteriori error estimates for an elliptic problem with dynamical boundary conditions* App. Math. Inf. Sc., 6 (9), DOI :10.12785/amis/100121 (2015) pp 2205-2217
- T. El Arwadi, T. Sayyah *Lp estimates for Dirichlet-to-Neumann operator and applications* EJDE, Vol. 2015, No. 258 pp 1-8, ISSN : 1072-6691
- T. El Arwadi, V. Flammang, G.Rhin, J.M Sac Épée *Extension of the notion of Mahler measure to a certain class of holomorphic functions. Properties and applications*. Results in Math 72, no. 1-2, 787-791 (2017)
- T. El Arwadi, M. Amine Cherif
The Schauder and Krasnoselskii Fixed-Point Theorems on a Frechet Space
Mediterranean Journal of Mathematics (2018) 15 :121 <https://doi.org/10.1007>
- M. Ali Haidar, T. El Arwadi, S. Israwi *Existence of a regular solution for 1D Green-Naghdi equations with surface tension* Boundary Value Problem (2018) 2018 : 136. <https://doi.org/10.1186/s13661-018-1055-2>

- T. El Arwadi, T. Sayah *A Regularization Scheme for 2D Conductivity Imaging by the D-Bar Method* Numerical Functional Analysis and Optimization, 40 :12, 1410-1425, DOI : 10.1080/01630563.2019.1606011
- T. El Arwadi, M.I Copetti, W. Youssef *On the theoretical and numerical stability of the thermoviscoelastic Bresse system* Z Angew Math Mech. 2019, 99 :e201800207, <https://doi.org/10.1002/zamm.201800207>
- T. El Arwadi, W. Youssef *On the Stabilization of the Bresse Beam with Kelvin-Voigt Damping* Appl Math Optim (2019). <https://doi.org/10.1007/s00245-019-09611-z>
- M. Berjawi, T. El Arwadi, S. Israwi *A rigorous derivation of the extended KDV equation* J. Physics Equations : Conf. Series (2020). 1564 (2020) 012006 IOP Publishing , doi : 10.1088/1742-6596/1564/1/012006
- T. El Arwadi, T. Sayah *A new regularization of the D-bar method with complex conductivity* Complex Variables and Elliptic Equations (2021). 66 :5, 826-842, DOI : 10.1080/17476933.2020.1747056
- M.Haidar, T. El Arwadi, S.Israwi *Explicit solutions and numerical simulations for an asymptotic water waves model with surface tension* J. Appl. Math. Comput. 63, 655-681 (2020). <https://doi.org/10.1007/s12190-020-01333-8>
- N. Abou Jmeih, T. El Arwadi, S.Dib *A Priori Error Analysis of a Stabilized Finite-Element Scheme for an Elliptic Equation with Time-Dependent Boundary Conditions* Numer. Anal. Appl. 14, 297-315 (2021). <https://doi.org/10.1134/S19954>
- M.Bzeih, T. El Arwadi, A. Wehbe, M.Rincon, R.Madureira *Numerical analysis and simulation for a wave equation with dynamical boundary control* J. Sci. Comput. 87(1) : 6 (2021)
- M.Haidar, T. El Arwadi, S.Israwi *On the Green Naghdi system with surface tension in the Camassa-Holm scale* Ann Univ Ferrara 67, 83-110 (2021). <https://doi.org/10.1007/s11565-021-00357-7>
- M. Copetti, T. El Arwadi, J.Fernandez, M. G Nazo, W. Youssef *Analysis of a contact problem for a viscoelastic Bresse system* ESAIM : Mathematical Modelling and Numerical Analysis 55 (3), 887-911

- S.Slayi, T. El Arwadi, S. Dib *A Gauge-Uzawa scheme for a 2D micropolar Naviers Stokes system* Applied Numerical Mathematics 167, 45-72 (2021)
- M.Bzeih, M.Hindi, T. El Arwadi *Numerical analysis for Rayleigh system with dynamical boundary control* Arab. J. Math. 10, 331â349 (2021). <https://doi.org/10.1007/s40021-00310-8>
- T. El Arwadi, S. Israwi *An explicit solution with correctors for variable depth KdV and Camassa-Holm equations,* Journal of Engineering Mathematics 131 (1), 1-14
- M.Hindi, K. Zennir, J. Ouchenane, A. Choucha and T. El Arwadi *Bresse-Timoshenko type systems with thermodiffusion effects : Well-posedness, stability and numerical results* Accepted in Rendiconti del Circolo Matematico di Palermo 1â27, 2021. DOI : <https://doi.org/10.1007/s12215-021-00672-0>.
- D. SA. Junior, A. Ramos, M. Freitas, MJ. Dos Santos and T. El Arwadi *Polynomial stability for the equations of porous elasticity in one-dimensional bounded domains.* Math. Mech. Solids, 27, 2021, <http://dx.doi.org/10.1177/10812865211019074>
- T. El Arwadi, A. Wehbe, W. Youssef *Discrete observability of the Bresse Beam* (to appear in Math. Mech. Solids)
- B. Feng, T. El Arwadi, W. Youssef *Analysis of a laminated beam system with thermodiffusion effect* (To appear in Journal of Mathematical Analysis and Applications)
- M. Berjawi, T. El Arwadi, S.Israwi *A shallow water model with the Coriolis effect coupled with the surface tension* (Accepted in Monatshefte fur Mathematik)
- M.Bzeih, T. El Arwadi, A. Wehbe, M.Rincon, R.Madureira *A finite element scheme for a 2D- wave equation with dynamical boundary control* (Accepted in Mathematics and Computers in Simulation)
- H. Zougheib, T. El Arwadi, M. Rincon, R. Madureira *Do equal speed condition and exponential stability relate for the truncated thermoelastic Timoshenko system under Green Naghdi law ?* (Accepted in Journal of thermal stresses)
- A. Djebabla, H. Bouraoi, T. El Arwadi *Exponential stability for a thermoe-*

lastic Bresse system : theoretical and numerical study (Accepted in Mathematical Methods in Applied Sciences)

- J. Hassan, S. Messaoudi, T. El Arwadi, M. Hindi *Theoretical and numerical study of the decay in a viscoelastic Bresse System* (Submitted)
- T. El Arwadi, W. Youssef *Stabilization of the Bresse system with thermodiffusion effect* (Submitted)
- B. Feng, T. El Arwadi, W. Youssef *A nonlinear laminated Bresse system : wellposedness, stability and numerical results* (Submitted)
- H. Zougheib, T. El Arwadi, M. El Hindi *Asymptotic behavior of a Bresse-Timoshenko type system with microtemperature* (Submitted)
- H. Zougheib, T. El Arwadi, M. El Hindi *Energy decay analysis for porous elastic system with microtemperature : A second spectrum approach* (Submitted)
- H. Zougheib, T. El Arwadi, M. Rincon, R. Madureira *Asymptotic analysis for porous elastic system with Kelvin Voigt damping : The second spectrum perspective* (Submitted)
- A. Djebabla, H. Bouraoui, T. El Arwadi *On the stability of the Bresse thermoelastic system under the dual phase lag thermal law* (Submitted)

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| Conferences, workshops, research trimester |
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| 02/2009 | Contrôle et Problèmes Inverses pour les EDP : Aspects Théoriques et Numériques, at CIRM, Luminy. |
| 05/2009 | Journées de Metz 2009 at LMAM, Metz. |
| 09/2009 | Workshop FreeFem++ at Henri Poincaré institute. |
| 03/2010 | Inverse Problems for Waves : Methods and Applications (Ecole Polytechnique, Palaiseau) |
| 05/2010 | Journées de Metz 2010 at LMAM, Metz. |
| 06/2010 | Summer school on computational solution of inverse problems (Helsinki university) |
| 06/2011 | Trimester on Inverse Problems : Theoretical and Numerical Aspects of Inverse Problems and Scattering Theory (Madrid) |
| 07/2012 | 9th AIMS workshop (Orlando) |
| 07/2015 | Journée d'Analyse (San Joseph University) |
| 10/2015 | Journée des Problèmes Inverse (University Badgi-Mokhtar, Annaba, Algeria) |
| 03/2016 | Partial Differential Equations meeting (Lebanese University) |
| 07/2016 | 11th AIMS workshop (Orlando) |
| 06/2017 | Journées de Mathématiques Appliquées, Saint Joseph University (Beirut-Lebanon) |

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| Collaborators |
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— A. Tamasan (UCF, Florida, USA)

- M.A Cherif (Sfax university, Tunisia)
- H. Emamirad (Poitiers university, France)
- J.M Sac-Épée (Lorraine university, France)
- G. Rhin (Lorraine university, France)
- T. Sayah (San-Joseph university, Lebanon)
- A. Wehbe (Lebanese University, Lebanon)
- W. Youssef (Lebanese University, Lebanon)
- S. Israwi (Lebanese University, Lebanon)
- M. Rincon (University Federal Rio de Janeiro)
- R. Madureira (University Federal Rio de Janeiro)

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| Recent Invited Talks at Conferences and Workshops |
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- **01/2010** Séminaire d'Analyse Appliquée (Paris 13 university) *New approach for the D-bar method*
- **03/2010** Poster session at MMNS Workshop on Inverse Problems for Waves : Methods and Applications (Ecole Polytechnique, Palaiseau) *D-bar methods for the Inverse conductivity problem*
- **06/2010** Summer school on computational solution of inverse problems (Helsinki university) *New approach of the D-bar methods*
- **09/2010** Basque Center of Applied mathematics (Bilbao) *New approach of the D-bar methods*
- **01/2011** L.A.T.P (Marseille) *New approach of D-bar methods for non smooth conductivities*
- **05/2011** Trimester on Inverse problems (Madrid) *New approach for D-bar methods*
- **12/2012** LSMS meeting *New approach of D-bar methods*
- **07/2012** 9th AIMS workshop (Orlando) *New approach of D-bar methods*
- **12/2012** Lebanese University - Fanar *New approach of D-bar methods*
- **09/2013** San-Joseph University *On the Dirichlet-to-Neumann semigroup*
- **07/2015** San-Joseph University *The electrical Impedance Tomography and inverse problems*
- **10/2015** Université Badji Mokhtar Annaba *New approach of D-bar meth-*

ods for smooth and non smooth conductivities

- **03/2016** Lebanese University *Lp estimates for the D-bar method*
- **07/2016** 11th AIMS workshop (Orlando) *On the stability of reconstructing convection terms from boundary measurements*
- **03/2017** Journée de Mathématiques Appliquées (Saint Joseph University) *Theoretical and Numerical Observability of the Bresse Beam*
- **06/2018** Problemes inverse, control et optimization de formes (American University of Beirut) *Improvement of the D-bar method for the inverse conductivity problems*

Master thesis

- **2006** Master 2 *The Level set method with topological preservations, and applications in shape optimization* under direction of Dorin Bucur and Zakaria Belhachmi (Lorraine University)
- **2004** Master 1 *The Richard Feynman Path Integral and some applications in quantum physics* under direction of Jacques Langlois (Saint Joseph University)

Reviewer

Research Journals :

- Inverse Problem and Imaging (American Institute of Mathematical Science-USA)
- Electronic Journal of Differential Equations (Texas state University- USA)
- Inverse Problems (IOP science- UK)
- International Journal of Nonlinear Sciences and Numerical Simulation (De Gruyter- Germany)
- Computational and Applied Mathematics (Springer-Germany)
- Applied Numerical Mathematics (Elsevier-Netherlands)
- Zeitschrift für angewandte Mathematik und Physik (Springer-Germany)
- AIMS Mathematics (AIMS press-USA)
- Results in Applied Mathematics (Elsevier-Netherlands)

International Scientific Committees and Research groups

- 2012 -2015 Lebanese Society for the Mathematical Sciences (National Relations)
- 2015- Lebanese Society for the Mathematical Sciences (International Relations)
- 2016- Linear Algebra and High Performance Computing for Simulations (Member)

Meetings and Seminars organization.

- 2012 - LSMS annual meeting (member of the scientific committee).
- 2013 - LSMS annual meeting (member of the organizing committee).
- 2014 - LSMS annual meeting (member of the organizing committee).
- 2014 - LAAS annual Workshop (member of the scientific committee).
- 2015 - Day of Partial Differential Equations (member of the Organizing committee).
- 2016 - LAAS annual workshop (member of the scientific committee).
- 2016 - LSMS annual meeting (member of the organizing committee).
- 2017 - LSMS annual meeting (member of the organizing committee).
- 2018 - LSMS annual meeting (member of the organizing committee).
- 2018 - PICO meeting (member of the organizing committee).
- 2018 - SIRCAUSS conference (member of the organizing committee-poster session).

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| Department and University services . |
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- Curriculum committee, member.
- Comprehensive exam committee, member.
- Students Activities committee, member.
- Day of Partial Differential Equations (BAU), Organizer.
- Graduate seminar in Mathematics and Computer sciences, organizer.
- Research committee , Member.
- Students activities committee , Member.