

Gintides Drossos

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EDUCATION: 1987 Diploma in Mathematics, University of Patras, Greece.

1992 Ph.D in Mathematics, Nat. Tech. Univ. of Athens, Greece.

1995 - 2000 : Teaching Assistant, Hellenic Army Academy

1999 – 2000 : Teaching Assistant, Hellenic Naval Academy

2000 – 2006 : Lecturer, Hellenic Naval Academy

2006 – 2012 : Assistant Professor, Dept. of Mathematics, NTUA

2012 - 2017: Associate Professor, Dept. of Mathematics, NTUA

2017 Professor, Dept. of Mathematics, NTUA

RESEARCH INTERESTS

Partial Differential Equations and particularly Theoretical and Computational, Direct and Inverse Scattering Problems in Acoustics, Electromagnetism, Elasticity and Thermoelasticity. Integral Equations, Direct and Inverse Spectral Problems.

TEACHING EXPERIENCE Undergraduate Courses in NTUA

- “Software for Mathematics and Physics”, School of Applied Mathematical and Physical Sciences (2002-2005).
- “Ordinary Differential Equations”, Schools of: Electrical Engineering (2006-2010), Civil Engineering (2009-2011), Mechanical Engineering (2005-2008) Applied Mathematical and Physical Sciences (2009-2016).
- “Complex Functions - Partial Differential Equations”, Schools of: Electrical Engineering (2005-2009), Mechanical Engineering (2008-2012), Civil Engineering (2010-2016).

- “Topics in Partial Differential Equations (elective course)”, School of Applied Mathematical and Physical Sciences (2009-2016).

Graduate Courses in NTUA

- “Integral Equations”, School of Applied Mathematical and Physical Sciences (2006-2016).
- “Use of Symbolic Languages in Mathematical Physics”, School of Naval Engineering (1998-2008).

PUBLICATIONS:

1. D. Gintides and K. Kiriaki, “Low-Frequency Acoustic Scattering by a Hard Inverse Prolate Spheroid”, *Quart. I. Appl. Math. Mech.* , 45, p. 231-244, 1992.
2. D. Gintides and K. Kiriaki, “On the Continuity Dependence of Elastic Scattering Amplitudes upon the Shape of the Scatterer”, *Inverse Problems*, 8, p. 95-118, 1992.
3. A. Charalambopoulos and D. Gintides, “On the Analyticity of the Solution of the Equation of Elasticity in the Exterior Region of the Cavity with Respect the Wave Number”, *ZAMM* , 78(3), p. 1-8, 1998.
4. D. Gintides, “An Inverse Electromagnetic Scattering Problem from a Dielectric Body in R^3 ”, *Bulletin of the Greek Mathematical Society*, 40, p. 57-67, 1998.
5. G.N. Constantinides, D. Gintides, S.E. Kattis, K. Kiriaki, C.A. Paraskeva, A.C. Payatakes, D. Polyzos, S.V. Tsinopoulos, and S.N. Yannopoulos, “Computation of Light Scattering by Axisymmetric Non-Spherical Particles and Comparison with Experimental Results” , *Applied Optics*, Vol. 37 (3), p. 7310-7319, 1998.
6. D. Gintides and K. Kiriaki, “The Inverse Scattering Problem for Dielectric Bodies”, *Applicable of Analysis*, Vol. 70 (3-4), p. 385-403, 1999.
7. D. Gintides, “The Inverse Scattering Problem in Three Dimensional Linear Elasticity”, *ZAMM*, 79 (10), p. 675-684, 1999.
8. D. Gintides and K. Kiriaki, “The Far-Field Equations in Linear Elasticity - an Inversion Scheme”, *ZAMM*, 81 (5), p. 305 -316 , 2001.
9. A. Charalambopoulos, D. Gintides and K. Kiriaki, “On the Uniqueness of the

Inverse Elastic Scattering Problem for Periodic Structures”, *Inverse problems*, 17, p. 1923-1935, 2001.

10. E. Argyropoulos, D. Gintides and K. Kiriaki, “On the Condition Number of Integral Equations in Linear Elasticity using Modified Green's Function”, *ANZIAM I.*, 44, p. 1-16, 2002.

11. D. Gintides and K. Kiriaki, “The Far-Field Equations in Linear Elasticity for Disconnected Rigid Bodies and Cavities”, *J. Comput. Anal. Appl.* 4(3), p. 193-209, 2002.

12. A. Charalambopoulos, D. Gintides and K. Kiriaki, “Radiation Conditions for Rough Surfaces in Linear Elasticity”, *Quart. I. Mech. Appl. Math.* 55(3), p. 421- 441, 2002.

13. A. Charalambopoulos, D. Gintides and K. Kiriaki, “The Linear Sampling Method for the Transmission Problem in Three-Dimensional Linear Elasticity”, *Inverse Problems*, 18, p. 547-558, 2002.

14. A. Charalambopoulos, D. Gintides and K. Kiriaki, “The Linear Sampling method for Non-Absorbing Penetrable Elastic Bodies”, *Inverse Problems*, 19 (3) , p. 549-561, 2003.

15. K. Anestopoulos, E. Argyropoulos, D. Gintides and K. Kiriaki, “The Green's Function for the Three-Dimensional Linear Elasticity in Periodic Domains”, *Bulletin of the Greek Mathematical Society*, Vol. 52, p. 35-47, 2006.

16. D. Gintides, “Local Uniqueness for the Inverse Scattering Problem in Acoustics via the Faber - Krahn Inequality”, *Inverse Problems*, 21, p. 1195-1205, 2005.

17. K. Anagnostopoulos, A. Charalambopoulos, D. Gintides, K. Kiriaki and A. Kirsch, “The Factorization Method in Inverse Elastic Scattering from Penetrable Bodies”, *Inverse Problems*, 19 , p. 549-561, 2007.

18. D. Gintides and K. Kiriaki, “Identification of Planar Screens at Low Frequencies in Thermoelasticity”, *Journal of Computational Analysis and Applications*, Vol. 10, p.83-100, 2008.

19.D. Dionysiou, D. Gintides, G. Stamatakos, K. Kiriaki and N. Uzunoglu, “Critical Parameters Determining Standard Radiotherapy Treatment Outcome for Glioblastoma Multiforme: A Computer Simulation”, *The Open Biomedical Engineering Journal*, 2, p. 43–51, 2008.

20. T. Arens, D. Gintides and A. Lechleitner, “Variational Formulations for Scattering

in a 3-Dimensional Acoustic Waveguide”, *Mathematical Methods in the Applied Sciences*, Vol. 31 (7), p. 821-847, 2008.

21. F. Cakoni and D. Gintides, “New Results on Transmission Eigenvalues”, *Inverse Problems and Imaging*, 4 (1), p. 39-48, 2010.

22. F. Cakoni, D. Gintides and H. Haddar, “The Existence of an Infinite Discrete Set of Transmission Eigenvalues”, *SIAM Journal on Mathematical Analysis*, 42 (1), p. 237-255, 2010.

23. F. Cakoni, D. Colton and D. Gintides, “The Interior Transmission Eigenvalue Problem”, *SIAM Journal on Mathematical Analysis*, **42**, 6, p. 2912-2921, 2010.

24. T. Arens, D. Gintides and A. Lechleitner, “Direct and Inverse Medium Scattering in a 3D Stratified Waveguide”, *SIAM Journal on Applied Mathematics*, 7, p. 753-772, 2011.

25. T. Aktosun, D. Gintides and V. Papanicolaou, “The Uniqueness in the Inverse Problem for Transmission Eigenvalues for the Spherically Symmetric Variable-Speed Wave Equation”, *Inverse Problems*, 27, 115004, 2011.

26. D. Gintides and L. Midrinos, “Inverse Scattering Problem for a Rigid Scatterer or a Cavity in Linear Elasticity”, *ZAMM*, 91, 4, p. 276-287, 2011.

27. D. Gintides and M. Sini, “Identification of Obstacles using only the Scattered P-Waves or the Scattered S-Waves”, *Inverse Problems and Imaging*, p. 39–55, 2012.

28. D. Gintides, M. Sini and N. Trung-Thanh, “Detection of Point-like Scatterers using One Type of Scattered Elastic Waves”, *Journal of Computational and Applied Mathematics*, 236(8), p.2137-2145 2012.

29. D. Gintides and N. Pallikarakis, “A computational method for the inverse transmission eigenvalue problem”, *Inverse Problems*, **29**, 104010 [doi:10.1088/0266-5611/29/10/104010](https://doi.org/10.1088/0266-5611/29/10/104010). 2013

30 D. Gintides and K. Kiriaki, “Solvability of the integrodifferential equation of Eshelby's equivalent inclusion method”, *The Quarterly Journal of Mechanics and Applied Mathematics*, **68**(1):85-96 41, 2015.

31. D. Gintides and L. Midrinos, “The direct scattering problem of obliquely incident electromagnetic waves by a penetrable homogeneous cylinder” *Journal of Integral Equations and Applications*, **28**, (1), p.1-32, 2016.

32. D. Gintides and N. Pallikarakis, “The inverse transmission eigenvalue problem for a discontinuous refractive index”, *Inverse Problems*, **33**, doi: 10.1088/1361-6420, 2017.

33. D. Gintides, R. Chapko and L. Mindrinos, “The inverse scattering problem by an elastic inclusion”, *Advances in Computational Mathematics*, doi: 10.1007/s10444-017-9550-z, 2017 .

34. D. Gintides and L. Mindrinos , “The integral equation method for the inverse electromagnetic scattering problem by an infinitely long penetrable cylinder at oblique incidence”, *Applicable Analysis*, doi:10.1080/00036811.2017.1402891, 2017.

DEPARTMENTAL REPORTS

1. D. Gintides, K. Kiriaki and G. F. Roach, “The Modified Green’s Function for Exterior Problems in Linear Elasticity”, Depart. Report No. 5, Strathclyde University, p. 1-26, 1994.

PUBLICATIONS IN SPECIAL ISSUES

1. D. Gintides and K. Kiriaki, “Multiple Scattering of Elastic Waves by Sphere Configurations”, *Research Notes on Mathematics Series*, Pitman, p. 201-214, 1998.

2. G.N. Constantinides, D. Gintides, S.E. Kattis, K. Kiriaki, C.A. Paraskeva, A.C. Payatakes, D. Polyzos, S.V. Tsinopoulos, and S.N. Yannopoulos, “Particle Shape and Size Analyzer”, *Research Notes on Mathematics Series*, Pitman, p. 65-79, 1998.

3. D. Gintides and K. Kiriaki, “On the Far-field Operators for Mixed Scattering Problems in Linear Elasticity”, *Methods in Scattering Theory and Biomedical Technology*, World Scientific Publishing, p. 61-67, 2001.

4. A. Charalambopoulos, D. Gintides, K. Kiriaki, “The Linear Sampling Method for N-Bodies in 2-Dimensional Linear Elasticity”, *Methods in Scattering Theory and Biomedical Technology*, World Scientific Publishing, p. 126-135, 2003.

4. A. Charalambopoulos, D. Gintides, K. Kiriaki, “On the Interior Transmission Problem in Linear Elasticity”, *Methods in Scattering Theory and Biomedical Technology*, World Scientific Publishing, p. 194-202, 2001.

5. A. Charalambopoulos, D. Gintides, K. Kiriaki and A. Kirsch, “The Factorization Method for an Acoustic Waveguide”, *Mathematical Methods in Scattering Theory and Biomedical Engineering*, World Scientific Publishing, p. 120-127, 2006.

6. D. Gintides, A. Lygidaki, K. Kiriaki and L. Midrinos “The Detection of Point Scatterers in a Waveguide”. *Advanced Topics in Scattering and Biomedical Engineering*, World Scientific Publishing, p. 38-46, 2008.

7. F. Cakoni, D. Colton and D. Gintides, “The Interior Transmission Eigenvalue Problem”, *Advanced Topics in Scattering Theory and Biomedical Engineering*, World Scientific Publishing, p. 368-380, 2010.

8. D. Gintides and L. Midrinos, “The Inverse Scattering Problem in Linear Elasticity via a pair of Non Linear Integral Equations”, *Advanced Topics in Scattering Theory and Biomedical Engineering*, World Scientific Publishing, p. 12-19, 2010.

ANNOUNCEMENTS IN CONFERENCES

1. D. Gintides and K. Kiriaki, “Continuity Dependence of Scattering Amplitude upon the Shape of the Scatterer in two-dimensional Linear Elasticity”, 2nd Panhellenic Conference on Mathematical Analysis, Athens 1992.

2. D. Gintides, R. Kleinman and K. Kiriaki, “Low-Frequency Electromagnetic Scattering for Non-Convex Bodies”, IEEE-APS/U.R.S.I./NEM Meeting, Chicago, 1992.

3. D. Gintides and K. Kiriaki, “The Modified Green’s Function for Exterior Problems in Linear Elasticity”, Symposium of Applied Mathematical Analysis in Mechanics, Thessaloniki, 1993.

4. D. Gintides and A. Charalambopoulos, “On the Analytic Dependence of the Solution of the Equation of Elasticity”, Workshop on Direct and Inverse Scattering Methods, Athens, 1993.

5. D. Gintides and K. Kiriaki “An Inverse Electromagnetic Scattering Problem”, 3th, Hellenic-European Conference on Mathematics and Informatics, Athens, 1996.

G.N. Constantinides, D. Gintides, S.E. Kattis, K. Kiriaki, C.A. Paraskeva, A.C. Payatakes, D. Polyzos, S.V. Tsinopoulos, and S.N. Yannopoulos, “Size Analyser for Non Spherical Particles”, 1th PanHellenic Scientific Symposium on Chemical Engineering, Athens, 1997.

6. G.N. Constantinides, D. Gintides, S.E. Kattis, K. Kiriaki, C.A. Paraskeva, A.C. Payatakes, D. Polyzos, S.V. Tsinopoulos, and S.N. Yannopoulos, “Shape, Size and Refractive Index Analyser of Biological Particles”, 1th PanHellenic Conference of Biomedical Technology, Patras, 1997.

7. G.N. Constantinides, D. Gintides, S.E. Kattis, K. Kiriaki, C.A. Paraskeva, A.C. Payatakes, D. Polyzos, S.V. Tsinopoulos, and S.N. Yannopoulos, "The Inverse
8. Scattering Problem for Dielectric Bodies - An Application to Shape and Refractive Index Analyzer", PIERS 98 Progress in Electromagnetics Research Symposium, Nantes, France, 1998.
9. D. Gintides and V. Sevroglou, "Green's Function Technique in Linear Elasticity in R³", 5th National Congress on Mechanics, Ioannina, 1998.
10. D. Gintides and K. Kiriaki "The Far Field Equation Method of Inverse Scattering in Linear Elasticity", 5th National Congress on Mechanics, Ioannina, 1998.
11. D. Gintides and K. Kiriaki, "Far Field Equations in Linear Elasticity –Solution Method for the Inverse Scattering Problem", 7th Panhellenic Conference on Mathematical Analysis, Cyprus, 1999.
- 12.A. Charalambopoulos, D. Gintides, K. Kiriaki, "Radiation Conditions for Rough Surfaces with Dirichlet Boundary Conditions in Linear Elasticity", 8th Panhellenic Conference on Mathematical Analysis, Athens, 2000.
13. A. Charalambopoulos, D. Gintides, K. Kiriaki, "The Simple Method for the Inverse Scattering Problem for Elastic Waves", 9nd PanHellenic Conference on Mathematical Analysis, Chania, 2002.
14. A. Charalambopoulos, D. Gintides, K. Kiriaki, "The Inverse Scattering Problem for a Cavity in a Three Dimensional Elastic Half Space", Influence of Traditional Mathematics and Mechanics on Modern Science and Technology, Messini, 2004.
15. A. Charalambopoulos, D. Gintides, K. Kiriaki and A. Kirsch, "The Inverse Scattering Problem in an Acoustic Waveguide", 11nd PanHellenic Conference on Mathematical Analysis, Athens, 2004.
16. D. Gintides "Inverse Boundary Value Problems in Linear Elasticity", International Conference on Inverse Scattering Problems Honoring D. Colton and R. Kress, Sestri Levante, Italy, 2008. (Invited Speaker).
17. T. Arens, D. Gintides and A. Lechleiter, "The Factorization Method for Inverse Scattering in 3D Waveguides", International Conference on Inverse Scattering Problems Honoring D. Colton and R. Kress, Sestri Levante, Italy, 2008.
18. D. Gintides, K. Kiriaki and R. Kress, "Inverse Boundary Value Problem in Linear Static Elasticity", 12nd PanHellenic Conference on Mathematical Analysis, Athens, 2008.

19. D. Gintides and F Cakoni, "A Discrete Variational Method to Determine the Index of Refraction from Far Field Measurements", Applied Inverse Problems, Vienna, Austria, 2009.
20. D. Gintides and L. Midrinos, "The Inverse Scattering Problem for Few Incident Waves", (PICO'10), Cartagena, Spain, 2010.
21. D. Gintides and L. Midrinos, "On the Numerical Solution of Nonlinear Integral Equations in Elastodynamics", Dynamics in Samos - Workshop on Differential Equations, Dynamical Systems and Applications, Samos, 2010.
22. D. Gintides and L. Midrinos, "The Method of Nonlinear Integral Equations for the Inverse Scattering Problem in Linear Elasticity", 13th PanHellenic Conference on Mathematical Analysis, Ioannina, 2010.
23. D. Gintides "New Results About Existence of Transmission Eigenvalues", Inverse Problems Modelling and Simulation, Antalya, Turkey, 2010 (Invited Speaker).
24. D. Gintides and M. Sini, "On Uniqueness Theorems in Inverse Obstacle Scattering of Elastic Waves", Inverse Problems Modelling and Simulation, Antalya, Turkey, 2010.
25. D. Gintides and L. Midrinos, "The Detection of an Inclusion in 2-D Linear Elasticity using Non-Linear Integral Equations", IPM 2011-International Conference on Inverse Problems in Mechanics of Structure and Materials, Poland, 2011.
26. D. Gintides, "The Inverse Problem for Non-Homogeneous Media with the Method of Transmission Eigenvalues", Conference of Analysis for New Researchers, Athens, 2011 (Invited Speaker).
27. D. Gintides, "The Inverse Transmission Eigenvalue Problem for Spherically Symmetric Index of Refraction", Applied Inverse Problems, College Station, Texas, USA, 2011.
28. D. Gintides, "The Inverse Transmission Eigenvalue Problem for Spherically Symmetric Refractive Index or Potential", International Conference on Inverse Problems and Related Topics, NanJing, China, 2012.
29. D. Gintides, , "The Inverse Transmission Eigenvalue Problem for Spherically Symmetric Refractive Index ", Inverse Days, Zivaskyla, Finland, 2012.
30. D. Gintides, "The Inverse Transmission Eigenvalue", International Conference on Novel Directions in Inverse Scattering, Delaware, USA, 2013.
31. D. Gintides, X. Markenscoff and K. Kiriaki, "Well-posedness of Eshelby's

inhomogeneity equation in static elasticity for general shapes via the interior transmission problem”, Inverse Problems: Scattering, Tomography and Parameter Identification - Conference on the occasion of Andreas Kirsch's 60th birthday, Bad Herrenalb, April 8-11, 2013.

32. D. Gintides and N. Pallikarakis, “The inverse transmission eigenvalue problem for a discontinuous refractive index”, Inverse Problems: Modeling and Simulation (IPMS-2014), Fethiye, Turkey, 2014.

33. D. Gintides and N. Pallikarakis, “Uniqueness theorems for the inverse transmission eigenvalue problem for a discontinuous refractive index”, Modern Mathematical Methods in Science and Technology (M3ST), Kalamata, Greece, 30/8-1/9 2015.

34. D. Gintides, “The Inverse ITE Problem for Discontinuous Refractive Index”, Applied Inverse Problems (AIP), Helsinki, Finland, 2015.

EDITOR – TRANSLATIONS OF MATHEMATICAL TEXTBOOKS

1. "Elementary Differential Equations and Boundary Value Problems", William E. Boyce and Richard C. DiPrima, 10th edition, 2015, University of NTUA (Translation team: TH. Grammenos, J. Karafilis, A. Spanou, Editors: D. Gintides, K. Kiriaki).

In progress:

2. "Partial Differential Equations: An Introduction", Second edition, Walter A. Strauss, ed. Willey House, the University Press NTUA (Translation team: TH. Grammenos A. Spanos, Editors: D. Gintides, K. Kiriaki).

PARTICIPATION IN SCIENTIFIC COMMITTEES OF INTERNATIONAL CONFERENCES

1. Member of the International Scientific Committee for the series of Conferences "Inverse Problems Modelling and Simulation", Antalya, Turkey, 2012 and Fethiye, Turkey, 2014.

2. Member of the Scientific Committee of the Conference "WAVES 2017" - Minneapolis, USA, 15 to 19 May 2017.

3. Member of the Scientific Committee of the Conference "Ukrainian Conference in Applied Mathematics", September, 28-30, 2017, Lviv, Ukraine.

PH. D. THESIS SUPERVISION

1. Leonidas Midrinos, “Inverse Boundary Value Problems for the Detection of Cavities and Inclusions in Linear Elasticity”, June 2011.

2. Nikolaos Pallikarakis, “The Inverse Transmission Eigenvalue Problem”, it is finished, in the procedure for defence 2017.

DIPLOMA THESIS SUPERVISION

I have supervised more than 20 undergraduate and 5 graduate diploma thesis

COLLABORATIONS

I am collaborating with researchers from the following: University of Karlsruhe Germany (two visits, 2 and 1 weeks), University of Delaware, USA (6 visits weekly), University Goettingen (1 visit weekly) and Ecole Polytechnic, CMAP, France (5 visits weekly) , University of Vienna, Radon Institute (1 week visit).

In the winter semester of the academic year 2014-15 I received a sabbatical leave. During this period I stayed the half time at the University of Delaware in collaboration with D. Colton and F. Cakoni and the remainder in Ecole Polytechnic, CMAP, for collaboration with H . Haddar.

ACADEMIC ADMINISTRATION - PARTICIPATION IN COMMITTEES

- Member of the Scholl Committee (2007-2009, 2010-11).
- Coordinator of the Undergraduate Studies Committee of the Department of Mathematics (2009-2014) and member of corresponding Committee of the Scholl. Includes presentations and workshops for improving undergraduate studies.
- Member of the NTUA Committee for Athletic Activities (2011-13).
- From November 2015 (Ac. Years: 2015-16, 2016-17) I am elected Head of the Department of Mathematics.

CITATIONS

I have more than 500 independent citations.

REVIEWER

I am reviewer in many International Journals of Applied Mathematics: SIAM Journal on Mathematical Analysis, SIAM Journal on Applied Mathematics, Inverse Problems and Imaging, Applicable Analysis, Inverse Problems, Inverse Problems In Science & Engineering, Journal of Mathematical Imaging and Vision, Applied Mathematics Letters, Optics & Laser Technology, Mathematics Review AMS.

RESEARCH PROJECTS:

1. “Development of Solution Methods for the Inverse Scattering Problem and Applications in Innovation Technologies”, PENED, (GSRT), 1991.
2. “Early Diagnosis: New Instruments for Early Diagnosis and Biotechnological Applications”, EPET II (GSRT, EU), 1995 - 98, (Principal Investigator for NTUA).
3. “Mathematical Theory of Multiple Scattering for Acoustic, Electromagnetic and Elastic Fields”, PENED, (GSRT), 1996.
4. “The Inverse Scattering Problem - Applications in Biomedicine”, Archimedes, ICCS, NTUA, 2000.
5. “The Inverse Scattering Problem from Infinite Surfaces - Identifying Submerged Objects”, Thales, NTUA, 2002.
6. “Genomic Expansion and Mathematical Formalism Four-Dimensional Simulation Model for the Development of Cancer Tumors and their Response to Radiotherapy (Group: In Silico Oncology), Pythagoras II, NTUA, 2005.
7. “The Factorization Method for Detecting Objects in Acoustic Waveguides and Elastic Media”, Hellenic – German Cooperation, IKYDA, 2005.
8. “New Methods for Solving Inverse Problems”, PEBE, NTUA, 2007 (Scientific Responsible).
9. “Inverse Scattering Methods in Linear Elasticity via Indicator Functions”, PEBE, NTUA, 2010 (Scientific Responsible).