

# CURRICULUM VITAE

## VASSILIOS A. DOUGALIS

Born on 19 March 1949 in Athens, Greece  
Citizen of Greece  
Married, with two children

### Address

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### Education

- B.S.E. in Civil Engineering, Princeton University, (1971). (With highest honors.)
- S. M. in Applied Mathematics, Harvard University, (1973).
- Ph. D. in Applied Mathematics, Harvard University, (1976).

### Research Area

Applied Mathematics (Numerical Analysis, Partial Differential Equations, Nonlinear Waves, Underwater Acoustics).

### Principal Professional Appointments

- Assistant Professor, Mathematics Department, University of Tennessee, Knoxville, (1976-82).
- Associate Professor, Mathematics Department, University of Tennessee, Knoxville, (1982-86).

- Professor, Mathematics Department, University of Crete, Heraklion, Greece, (1983-91), Associate Chairman, (1986-91).
- Professor, Mathematics Department, National Technical University, Athens, Greece, (1991-95).
- Professor, Mathematics Department, University of Athens, Greece (1995-2016), Emeritus (2016- ).
- Director, Institute of Applied and Computational Mathematics, FO.R.T.H, Heraklion, Greece (2004 - 2016).
- Vice Chairman of the Board of Directors of FO.R.T.H and Vice Director of the Central Administration of FO.R.T.H (2009 – 2010 and 2011-2016).
- Chairman of the Board of Directors of FO.R.T.H and Acting Director of the Central Administration of FO.R.T.H (2010-2011).

#### **Concurrent and Other Professional Appointments of a Month or More**

- Teaching Fellow and Research Assistant in Applied Mathematics, Harvard University, (1972-76).
- Associate Director, Institute of Applied and Computational Mathematics, Research Center of Crete and FO.R.T.H. (1986-2004).
- Visiting Professor, Mathematics Department, University of Tennessee, Knoxville, (Mar.-Apr. 1988, Jan. 1989, Dec. 1989, Oct.-Dec. 1990, Aug.-Dec. 1994).
- Member of the Board of Directors of FORTHNET S.A. (2010-2016).

#### **Honors**

- Award for outstanding teaching at the graduate level, Mathematics Department, University of Tennessee (1979).
- D. Kappos Memorial Lecture, Hellenic Mathematical Society (1996).
- Distinguished University Teaching Prize in memory of V. Xanthopoulos and St. Pnevmatikos (2000).
- Distinguished Member of FORTH (2017- ).

#### **Committees and Professional Service** (last 10 years)

- Member of the Committee for the selection of the recipients of the Distinguished University Teaching Prize in memory of V. Xanthopoulos and St. Pnevmatikos (2001- ).
- Member of the Scientific Committee of the “Sixth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena. Computations and Theory”, Athens, Georgia, March 23-26, 2009. Co-organizer (with J.L. Bona and M. Chen) of the special session “Nonlinear Waves” in the same conference. Guest editor of the special issue of *J. Math. and Computers in Simulation* with papers from this conference.
- Member of the Organizing Committee of the “International Conference on Modern Mathematical Methods in Science and Technology, M3ST’ 09”, Poros, Greece, September 3-5, 2009.
- Member of the Organizing Committee of NumAn2010, Conference in Numerical Analysis, Chania, Greece, September 15-18, 2010. Member of the guest editorial committee of the special issue of *Appl. Numerical Mathematics* (vol. 67, May 2013) with papers from this conference.
- Co-organizer of the “Fifth Workshop on Numerical Methods for Evolution Equations”, IACM-FORTH, Heraklion, Greece, September 24-25, 2010.
- Member of the Scientific Committee of the “Seventh IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena, Computation and Theory”, Athens,

- Georgia, April 4-7, 2011. Co-organizer (with J.L. Bona and M. Chen) of the special session “Nonlinear Waves” of the same conference.
- Member of the Sectorial Scientific Council (TES) for Mathematics and Information Sciences, National Council for Research and Innovation , GSRT, 2011-2017, Chairman 2018-
  - Guest editor of special issues vol. 82, no.6,7, “Mathematics and Computers in Simulation”, 2012.
  - Co-organizer of the “Sixth Workshop on Numerical Methods for Evolution Equations”, IACM-FORTH, Heraklion, Greece, September 20-21, 2012.
  - Member of the National Advisory Board (Greece) and the European Advisory Board of the research EU program MASCIL on mathematics and science education, 2013-2016.
  - Co-organizer (with A.Duran) of the minisymposium “Numerical approximation of nonlinear waves” in the SciCADE 2013 International Conference, Valladolid, Spain, Sept.16-20, 2013.
  - Member of the Organizing and the Scientific Committees of “NumAn 2014-Sixth Conference on Numerical Analysis”, Chania, Greece, Sept. 2-5, 2014, and co-editor of the Conference Proceedings.
  - Co-organizer of the “Seventh Workshop on Numerical Methods for Evolution Equations”, IACM-FORTH, Heraklion, Greece, September 19-20, 2014.
  - Co-organizer (with A.Duran) of the minisymposium “Modelling, theory, and numerical approximation of nonlinear waves” in the SciCADE 2015 International Conference, Potsdam, Germany, Sept.14-18, 2015.
  - Member of the Editorial Committee of the special issue (vol. 104, pp.1-218, June 2016) of "Applied Numerical Mathematics" comprising of papers from the NumAn2012 and NumAn 2014 conferences.
  - Co-organizer of the “8th Workshop on Numerical Methods for Evolution Equations”, IACM-FORTH, Heraklion, Greece, September 23-24, 2016.
  - Member of the General Assembly and various committees of the Hellenic Foundation for Research and Innovation (ELIDEK), 2017-
  - Co-organizer (with A.Duran) of the minisymposium “Modelling, theory, and approximation of nonlinear waves” in the SciCADE17 International Conference, Bath, UK, Sept.11-15, 2017
  - Member of the Editorial Committee of the special issue vol. 41, No.3 (2018) of Mathematical Methods in the Applied Sciences.
  - Chairman of the Scientific Committee of the FCGM 2018 Conference, Athens, Greece, June 25-30, 2018
  - Co-organizer of the “9th Workshop on Numerical Methods for Evolution Equations”, IACM-FORTH, Heraklion, Greece, September 21-22, 2018.

#### **Recent Invited Talks (last 10 years)**

- 6<sup>th</sup> IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, Georgia, USA (March 2009).
- Workshop on tsunami waves in the Mediterranean, Tel Aviv University, Tel Aviv (June 2009).
- International Conference on Modern Mathematical Methods in Science and Technology, M3ST’ 09, Poros, Greece, (Sept. 2009).
- Main speaker, Workshop on Numerical Methods for Complex Fluid Flows, Wolfgang Pauli Institute, Vienna (Sept. 2009).
- NumAn 2010 Conference in Numerical Analysis, Chania, Greece (Sept. 2010).

- 5<sup>th</sup> Workshop on Numerical Methods for Evolution Equations, IACM-FORTH, Heraklion, Greece (Sept. 2010).
- 7<sup>th</sup> IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, Georgia, USA (April 2011).
- Conference on the Applications of Mathematics and Informatics in Military Science, Hellenic Army Academy, Greece (April 2011).
- Workshop on Modern Techniques in the Numerical Solution of PDE's, ACMAC, Heraklion, Greece (Sept. 2011).
- 28<sup>th</sup> Conference of the Greek Mathematical Society, Athens, Greece (Nov. 2011).
- Distinguished Lecture, Hellenic Open University, Patras, Greece (Feb. 2012).
- Middle East Technical University, Ankara, Department of Engineering Sciences seminar (May 2013).
- Workshop: “Wave Phenomena: Numerical methods and analysis”, ACMAC, Heraklion, Greece (July 2013).
- SciCADE 2013 International Conference, Valladolid, Spain (Sept. 2013).
- NumAn2014 Sixth Conference on Numerical Analysis, Chania, Greece (Sept. 2014).
- M3ST 2015 International Conference on Modern Mathematical Methods in Science and Technology, Kalamata, Greece (Aug.-Sept. 2015).
- SciCADE 2015 International Conference, Potsdam, Germany (Sept.2015).
- Mathematics Seminar, SEMFE, National Technical University of Athens, Greece (Dec. 2015).
- 15<sup>th</sup> Panhellenic Conference in Mathematical Analysis, University of Crete, Heraklion, Greece (May 2016).
- Scicade17 International Conference, Bath, UK (11 Sept 2017).
- Workshop on Modelling, Theory and Numerical Approximation of Nonlinear Wave Problems, Univ. Valladolid, Spain (24 Oct. 2017)
- FCGM 2018 Conference, Athens, Greece (28 June 2018).
- NASCA 2018 Conference, Kalamata, Greece (2 July 2018).
- Conference in honor of Georgios Akrivis, IACM, Heraklion, Greece (20 Sept. 2018).
- Colloquium talk, Math. Dept., University of Ioannina, Greece (7 Nov. 2018).

### **Doctoral Students**

- Ch. Makridakis (Ph.D. 1989, University of Crete) Galerkin finite element methods for the equations of Elastodynamics.
- N. A. Kampanis (Ph.D. 1992, University of Crete) Galerkin-finite element methods for interface problems in Underwater Acoustics.
- B. Pelloni (Ph.D. 1996, Yale University) Spectral methods for the numerical solution of nonlinear, dispersive wave equations. (Co-advisor with P.Jones).
- D. C. Antonopoulos (Ph.D. 2000, University of Athens) Systems of Boussinesq equations: Theory and Numerical Analysis.
- D. A. Mitsoudis (Ph.D. 2003, University of Athens) Finite element methods for axisymmetric indefinite boundary value problems and applications to underwater acoustics.
- D.C. Antonopoulou (Ph.D. 2006, University of Athens) Theory and numerical analysis of Parabolic Approximations
- D.E. Mitsotakis (Ph.D. 2007, University of Athens) Theory and numerical analysis of nonlinear dispersive wave equations: Boussinesq systems in one and two space dimensions
- Ch.A. Sfyarakis (Ph.D. 2008, University of Athens) Mathematical and numerical models for materials phase change problems

- I. Touloupoulos (Ph.D. 2009, University of Athens) Numerical solution of hyperbolic partial differential equations by the discontinuous finite element method (Co-advisor with J. Ekaterinaris).

### Master's Students

Supervisor in 31 Master's Theses.

### Published Papers

- (1975a) (with G. Birkhoff) Numerical solution of hydrodynamic problems, in *Advances in Computer Methods for Partial Differential Equations I*, ed. by R. Vichnevetsky, AICA, pp. 46-52.
- (1975b) (with G. Birkhoff) A comparison of numerical methods for solving wave equations, in *Proceedings of the First International Conference on Numerical Ship Hydrodynamics*, ed. by J. W. Schot and N. Salvesen, NSRDC, pp. 231-251.
- (1976) (with G. A. Baker) The effect of quadrature errors on finite element approximations for second-order hyperbolic equations, *SIAM J. Numer. Anal.*, 13, pp. 577-598.
- (1979) Multistep-Galerkin methods for hyperbolic equations, *Math. Comp.*, 33, pp. 563-584.
- (1979) (with G. A. Baker and S. M. Serbin) High-order accurate two-step approximations for hyperbolic equations, *RAIRO Analyse Numérique*, 13, pp. 201-226.
- (1979) (with S. M. Serbin) Two-step high-order accurate full discretizations of second-order hyperbolic equations, in *Advances in Computer Methods for Partial Differential Equations III*, ed. by R. Vichnevetsky and R. S. Stepleman, IMACS, pp. 214-220.
- (1980) (with G. A. Baker) On the  $L^\infty$ -convergence of Galerkin approximations for second-order hyperbolic equations, *Math. Comp.*, 34, pp. 401-424.
- (1980) (with G. A. Baker and O. A. Karakashian) On multistep-Galerkin discretizations of semilinear hyperbolic and parabolic equations, *Nonl. Anal.*, 4, pp. 579-597.
- (1980a) (with S. M. Serbin) On the superconvergence of Galerkin methods to second-order hyperbolic equations, *SIAM J. Numer. Anal.*, 15, pp. 431-446.
- (1980) (with G. A. Baker and S.M. Serbin) An approximation theorem for second-order evolution equations, *Numer. Math.*, 35, pp. 127-142.
- (1980) (with J. L. Bona), An initial-and boundary-value problem for a model equation for propagation of long waves, *J. Math. Anal. and Applics.*, 75, pp. 503-522.
- (1980b) (with S. M. Serbin) Some remarks on a class of rational approximations to the cosine, *BIT*, 20, pp. 204-211.
- (1981a) (with S. M. Serbin) On the efficiency of some fully discrete Galerkin methods for second-order hyperbolic equations, *Comp. And Maths. with Applics.*, 7, pp. 261-279.
- (1981b) (with S. M. Serbin) Higher-order time-stepping methods for second-order nonlinear systems of ordinary differential equations, in *Advances in Computer Methods for Partial Differential Equations IV*, ed. by R. Vichnevetsky and R. S. Stepleman, IMACS, pp. 269-273.
- (1981) (with I. Vardoulakis) On surface waves in a Gibson half-space, in *Proceedings of the International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics*, ed. By S. Prakash, 1, pp. 557-559.
- (1982) (with S. M. Serbin) On some unconditionally stable higher-order methods for the numerical solution of the structural dynamics equations, *Int'l J. Num. Meth. Eng'g.*, 18, pp. 1613-1621.

- (1982) (with G. A. Baker and O. A. Karakashian) On a higher order accurate fully discrete Galerkin approximation to the Navier-Stokes equations, *Math. Comp.*, 39, pp. 339-375.
- (1982) (with C. Corduneanu) A semidiscretization procedure for the Fitzhugh-Nagumo equations, in *Nonlinear Phenomena in Mathematical Sciences*, ed. by V. Lakshmikantham, Academic Press, pp. 269-278.
- (1983) (with G. A. Baker and O. A. Karakashian) Convergence of Galerkin approximations for the Korteweg-de Vries equation, *Math. Comp.*, 40, pp. 419-433.
- (1984) (with L. A. Bales and S. M. Serbin) New aspects of cosine schemes for second-order hyperbolic equations, in *Advances in Computer Methods for Partial Differential Equations V*, ed. by R. Vichnevetsky and R. S. Stepleman, IMACS, pp. 540-545.
- (1985) (with O. A. Karakashian) On some high order accurate fully discrete Galerkin methods for the Korteweg-de Vries equation, *Math. Comp.*, 45, pp. 329-345.
- (1985) (with L. A. Bales and S. M. Serbin) Cosine methods for second-order hyperbolic equations with time-dependent coefficients, *Math. Comp.*, 45, pp. 65-89.
- (1985) Fully discrete Galerkin methods for nonlinear second-order hyperbolic equations, in *Proceedings of the 11<sup>th</sup> IMACS World Congress on System Simulation and Scientific Computation*, ed. by B. Wahlstrom et al, NFA, 5, pp. 369-371.
- (1986) (with J. L. Bona and O. A. Karakashian) Fully discrete Galerkin methods for the Korteweg-de Vries equation, *Comp. and Maths. with Appls.*, 12A, pp. 859-884.
- (1989) (with L. A. Bales) Cosine methods for nonlinear second-order hyperbolic equations, *Math. Comp.*, 52, pp. 229-319, S15-S33.
- (1989) (with G. D. Akrivis) On high-order accurate Galerkin-type full discretization of the Schrödinger equation, in *Proceedings of the 9<sup>th</sup> Conference on Problems and Methods of Mathematical Physics (9.TMP)*, ed. by F. Kuhnert and B. Silberman, B. G. Teubner, Leipzig, pp. 19-26.
- (1990a) (with G. D. Akrivis) On a conservative, high-order accurate finite element scheme for the ‘parabolic’ equation, in *Computational Acoustics*, ed. by D. Lee, A. Cakmak, R. Vichnevetsky, Elsevier-North Holland, 1, pp.17-26.
- (1990b) (with G. D. Akrivis) Finite difference discretization with variable mesh of the Schrödinger equation in a variable domain, *Bull. Greek Math. Soc.*, 31, pp. 19-28.
- (1991a) (with G. D. Akrivis) Finite difference discretizations of some initial-and boundary-value problems with interface, *Math. Comp.*, 56, pp. 505-522.
- (1991b) (with G. D. Akrivis) On a class of conservative, highly accurate Galerkin methods for the Schrödinger equation, *RAIRO-MMAN*, 25, pp. 643-670.
- (1991) (with G. D. Akrivis and O. A. Karakashian) On fully discrete Galerkin methods of second-order temporal accuracy for the nonlinear Schrödinger equation, *Num. Math.*, 59, pp. 31-53.
- (1991) (with J. L. Bona, O. A. Karakashian and W. R. McKinney) Fully discrete methods with grid refinement for the generalized Korteweg-de Vries equation, in *Viscous profiles and numerical methods for shock waves*, ed. by M. Shearer, SIAM, pp. 1-11.
- (1992a) (with J. L. Bona, O. A. Karakashian and W. R. McKinney) Computations of blow-up and decay for periodic solutions of the generalized Korteweg-de Vries-Burgers equation, *Appl. Numer. Math.*, 10, pp. 335-355.
- (1992b) (with J. L. Bona, O. A. Karakashian and W. R. McKinney) Numerical approximation of blow-up and decay of solutions of the generalized Korteweg-de Vries-Burgers equation, in

- Proceedings of the ERCIM Workshop on numerical methods for linear and nonlinear problems in wave propagation*, FORTH, Heraklion, pp. 69-78.
- (1992a) (with G. D. Akrivis and N. A. Kampanis) Finite element methods for parabolic and wide-angle equations in Underwater Acoustics, in *Proceedings of the ERCIM Workshop on numerical methods for linear and nonlinear problems in wave propagation*, FORTH, Heraklion, pp. 112-122.
  - (1992c) (with J. L. Bona, O. A. Karakashian and W. R. McKinney) Numerical solution of the Generalized Korteweg-de Vries-Burgers equation with adaptive Galerkin methods, in *Proceedings, First National Congress on Computational Mechanics*, ed. by D. E. Beskos, University of Patras Press, 1, pp. 220-228.
  - (1992b) (with G. D. Akrivis and N. A. Kampanis) On finite element methods for interface problems in underwater acoustics, in *Proceedings, First National Congress on Computational Mechanics*, ed. by D. E. Beskos, University of Patras Press, 2, pp. 863-870.
  - (1992) (with G. D. Akrivis and O. A. Karakashian) Numerical methods for the Nonlinear Schrödinger Equation, in *Advances in computer methods for partial differential equations VII*, ed. by R. Vichnevetsky, D. Knight, and G. Richter, IMACS, pp. 1-7.
  - (1992c) (with G. D. Akrivis and N. A. Kampanis) On finite element approximations of the wide-angle parabolic equation, in *Advances in computer methods for partial differential equations VII*, ed. by R. Vichnevetsky, D. Knight, and G. Richter, IMACS, pp. 8-14.
  - (1992) (with G. D. Akrivis, O. A. Karakashian and W. R. McKinney) Galerkin-finite element methods for the Nonlinear Schrödinger Equation, in *Hellenic Research in Mathematics and Informatics'92*, ed. by E. A. Lipitakis, Hellenic Mathematical Society, pp. 421-442. Also in *Advances on Computer Mathematics and its Applications*, ed. by E. Lipitakis, World Scientific, Singapore 1993, pp. 85-106.
  - (1993a) (with G. D. Akrivis) On a conservative finite difference method for the third-order, wide-angle parabolic equation, in *Computational Acoustics: Acoustic Propagation*, ed. by D. Lee, R. Vichnevetsky and A. R. Robinson, North-Holland, 2, pp. 209-220.
  - (1993) (with G. D. Akrivis and O. A. Karakashian) On optimal-order error estimates for the nonlinear Schrödinger equation, *SIAM J. Numer. Anal.*, 30, pp. 377-400.
  - (1993b) (with G. D. Akrivis) Translation in Greek of “Computer methods for mathematical computations”, by G. E. Forsythe, M. A. Malcolm and C. B. Moler (Prentice-Hall 1977), University of Crete Press, Heraklion.
  - (1993c) (with G. D. Akrivis) Analysis of numerical methods for the parabolic and the wide angle equations, Lecture Notes, Advanced Course on Acoustical Oceanography, MAST-IACM/FORTH, Heraklion, June 1993.
  - (1994a) (with G. D. Akrivis and N. A. Kampanis) On Galerkin methods for the wide-angle parabolic equation, *J. Comput. Acoustics*, 2, pp. 99-112.
  - (1994) (with N. A. Kampanis and E. A. Vavalis) An efficient finite element method for the PE, *Proceedings of the 2<sup>nd</sup> European Conference on Underwater Acoustics*, ed. L. Bjorno, European Commission, Luxemburg 1994, vol. 1, pp. 363-368.
  - (1994b) (with G. D. Akrivis and N. A. Kampanis) Error estimates for finite element methods for a wide-angle parabolic equation, *Appl. Numer. Math.*, 16, pp. 81-100.
  - (1995) (with J. L. Bona, O. A. Karakashian and W.R. McKinney) Conservative, high-order numerical schemes for the generalized Korteweg-de Vries equation, *Phil. Trans. Roy. Soc. London, A* 351, pp. 107-164.

- (1996) (with N. A. Kampanis) Finite element methods for the Parabolic Equation with interfaces, *J. Comput. Acoustics*, 4, pp. 55-88.
- (1996) (with E. T. Flouri, N. A. Kampanis, and J. S. Papadakis) A 3D parabolic equation model with an impedance bottom boundary condition, *Proceedings of the 3<sup>rd</sup> European Conference on Underwater Acoustics*, ed. J. S. Papadakis, FORTH-IACM, Heraklion 1996, vol. 1, pp. 231-236.
- (1996) (with N. A. Kampanis, P. E. Tsompanopoulou and E. A. Vavalis) Linear system solvers of finite element discretizations of the Helmholtz equation, *Proceedings of the 3<sup>rd</sup> European Conference on Underwater Acoustics*, ed. J. S. Papadakis, FORTH-IACM, Heraklion 1996, vol. 1, pp. 279-284.
- (1996a) (with J. L. Bona, O. A. Karakashian, and W. R. McKinney) Numerical simulation of singular solutions of the generalized Korteweg-de Vries equation, *Contemporary Mathematics*, 200, pp. 17-29.
- (1996) (with G. D. Akrivis and G. E. Zouraris) Error estimates for finite difference methods for a wide-angle ‘parabolic’ equation, *SIAM J. Numer. Anal.*, 33, pp. 2488-2509.
- (1996b) (with J. L. Bona, O. A. Karakashian and W. R. McKinney) The effect of dissipation on solutions of the generalized Korteweg-de Vries equation, *J. Comp. & Appl. Math.*, 74, pp. 127-154.
- (1996) (with B. Pelloni) On spectral methods for the Benjamin-Ono equation, in *HERMIS'96, Proceedings of the 3<sup>rd</sup> Hellenic-European Conference on Mathematics and Informatics*, ed. by E. Lipitakis, Athens 1996, pp. 229-237.
- (1997) (with G. D. Akrivis) Introduction to Numerical Analysis, University of Crete Press, Heraklion. (In Greek. Second Edition 2004, Third Edition 2011.)
- (1997) (with G. D. Akrivis and O. A. Karakashian) Solving the systems of equations arising in the discretization of some nonlinear p.d.e.’s by implicit Runge-Kutta methods, *RAIRO-MMAN*, 31, pp. 251-288.
- (1998) (with D. C. Antonopoulos) Galerkin methods for the Bona-Smith version of the Boussinesq equations, in *Proceedings of the 5<sup>th</sup> National Congress on Mechanics*, ed. by P. S. Theocaris, D. I. Fotiadis and C. V. Massalas, University of Ioannina, Ioannina 1998, pp. 1001-1008.
- (1998a) (with N. A. Kampanis) Finite element methods coupled with nonlocal boundary conditions in underwater acoustics, in Proceedings of the Conference “Modelisation mathematique et numerique dans les Sciences de l' Ingenieur”, Beirut, Apr. 1997, *Lebanese Scientific Research Reports*, 3 (1998), pp. 293-306.
- (1998b) (with N. A. Kampanis) On finite element approximations of the Helmholtz equation in axisymmetric, unbounded waveguides with interfaces, in *Proceedings of the 5<sup>th</sup> National Congress on Mechanics*, ed. by P. S. Theocaris, D. I. Fotiadis and C. V. Massalas, University of Ioannina, Ioannina 1998, pp. 1009-1015.
- (1998) (with N. A. Kampanis and M. I. Taroudakis) Comparison of finite element and coupled mode solutions of the Helmholtz equation in Underwater Acoustics, in *Proceedings of the 4<sup>th</sup> European Conference on Underwater Acoustics*, ed. by A. Alippi and G. B. Cannelli, CNR-IDAC, Rome 1998, pp. 643-654.
- (1998) (with J. S. Papadakis, et al.) Ocean acoustic models for low frequency propagation in 2D and 3D environments, *ACUSTICA*, 84, pp. 1031-1041.



- (1998) (with E. T. Flouri and N. A. Kampanis) A finite element method for the Helmholtz equation in Underwater Acoustics, in *Mathematical and Numerical Aspects of Wave Propagation*, ed. by J. DeSanto, SIAM, Philadelphia 1998, pp. 585-587.
- (1998) (with G. D. Akrivis, O. A. Karakashian and W. R. McKinney) Numerical approximation of singular solutions of the damped nonlinear Schrödinger equation, in *ENUMATH'97*, ed. by H. G. Bock et al., World Scientific, Singapore 1998, pp. 117-124.
- (1999) (with N. A. Kampanis) Finite element solution of the Helmholtz equation in axially symmetric layered fluid waveguides, in *Theoretical and Computational Acoustics '97*, ed. by Y.-C. Teng et al., World Scientific, Singapore 1999, pp. 405-417.
- (1999a) (with N. A. Kampanis) On finite element approximations of the Helmholtz equation in axisymmetric, unbounded waveguides with interfaces, *J. Comp. Acoustics.*, 7, pp. 83-110.
- (2000) (with B. Pelloni) Numerical solution of some nonlocal, nonlinear, dispersive wave equations, *J. Nonlin. Science*, 10, pp. 1-22.
- (2000) (with D. C. Antonopoulos) Numerical approximations of Boussinesq systems, in *Proceedings of the 5<sup>th</sup> International Conference on Mathematical and Numerical Aspects of Wave Propagation*, ed. by A. Bermudez et al., SIAM, Philadelphia 2000, pp. 265-269.
- (2001a) (with B. Pelloni) Numerical modelling of two-way propagation of nonlinear dispersive waves, *J. Math. and Computers in Simulation*, 55, pp. 595-606.
- (2001b) (with B. Pelloni) Error estimates for a fully discrete spectral scheme for a class of nonlinear nonlocal dispersive wave equations, *Appl. Numer. Math.*, 37, pp. 95-107.
- (2001) (with G. D. Akrivis and G. E. Zouraris) Finite difference schemes for the ‘parabolic’ equation in a variable depth environment with a rigid bottom boundary condition, *SIAM J. Numer. Anal.*, 39, pp. 539-565.
- (2002) (with D. A. Mitsoudis and N. A. Kampanis) A finite element method for the Helmholtz equation in axially symmetric problems of underwater acoustics: error estimates and numerical experiments, in *HERCMA 2001, Proceedings of the 5<sup>th</sup> Hellenic-European Conference on Computer Mathematics and its Applications*, ed. by E. Lipitakis, Athens 2002, vol. 2, pp. 530-533.
- (2002) (with G. A. Athanassoulis, K. A. Belibassakis, N. A. Kampanis and D. A. Mitsoudis) Simulation of underwater sound propagation in a general stratified environment by a coupled mode and a finite element method, in *the Proceedings of the Forum Acusticum Sevilla 2002 Conference*, ed. by A. Calvo-Manzano et al., special issue of *Revista de Acustica*, vol. 33 (2002).
- (2002) (with D. A. Mitsoudis and I. G. Stratis) Translation in Greek of “Applied Mathematics”, by J. D. Logan (2nd ed., John Wiley, 1996), University of Crete Press, Heraklion.
- (2003) (with G. D. Akrivis, O. A. Karakashian and W.R. McKinney) Numerical approximation of blow-up of radially symmetric solutions of the nonlinear Schrödinger equation, *SIAM J. of Scientific Computing*, 25, pp. 186-212.
- (2004) (with D. Antonopoulou) Finite element discretization of the ‘parabolic’ equation in an underwater, variable bottom environment, in the *Proceedings of the 6<sup>th</sup> International Workshop on Advances in Scattering and Biomedical Engineering*, D.I. Fotiadis, C. V. Massalas (eds.), World Scientific, 2004, pp. 173-182.
- (2004) (with D. E. Mitsotakis) Solitary waves for the Bona-Smith system, in the *Proceedings of the 6<sup>th</sup> International Workshop on Advances in Scattering and Biomedical Engineering*, D.I. Fotiadis, C. V. Massalas (eds.), World Scientific, 2004, pp. 286-294.

- (2004) (with I. Vardoulakis, E. Vairaktaris and E. Papamichos) Subsidence Diffusion-Convection: II. Inverse Problem, *Computer Methods in Applied Mechanics and Engineering*, 193 (27-29), pp. 2761-2770.
- (2006) (with F. Sturm and G.E. Zouraris) Boundary conditions for the wide-angle PE at a sloping bottom, in the *Proceedings of the 8<sup>th</sup> European Conference on Underwater Acoustics*, S.M. Jesus and O.C. Rodriguez, eds., CINTAL, v.1, pp.51-56.
- (2006) (with G. D. Akrivis) Numerical methods for Ordinary Differential Equations, Crete University Press, Heraklion. (In Greek. Second edition 2013.)
- (2006) (with Ch. Sfyarakis) A fast numerical method for a simplified phase field model, in the *Proceedings of the 7<sup>th</sup> International Workshop on Mathematical Methods in Scattering Theory and Biomedical Engineering*, D. I. Fotiadis and C. V. Massalas, eds., World Scientific, pp. 208-215.
- (2007) (with J. L. Bona and D. Mitsotakis) Numerical solution of KdV-KdV systems of Boussinesq Equations: I, The numerical scheme and generalized solitary waves, *J. Math. And Computers in Simulation*, 74 (2007), pp. 214-228.
- (2007) (with D.C. Antonopoulou) Finite element discretizations of the Parabolic Equation in an underwater variable bottom environment, in *Acoustics 2006*, M. Taroudakis and P. Papadakis, eds., Greek Institute of Acoustics, Heraklion 2007.
- (2007) (with D.E. Mitsotakis and J.-C. Saut) On some Boussinesq systems in two space dimensions: Theory and numerical analysis, *ESAIM: Math. Modelling and Numer. Anal.* v. 41, pp. 825-854.
- (2007) (with A. Duran, M.A. Lopez-Marcos and D.E. Mitsotakis) A numerical study of the stability of solitary waves of the Bona-Smith family of Boussinesq systems, *J. Nonlinear Sci.* v. 17, pp. 569-607.
- (2008) (with D.C. Antonopoulou and G.E. Zouraris) A finite element method for the ‘Parabolic’ Equation in a range-dependent environment with a rigid bottom , in the *Proceedings of the 8<sup>th</sup> International Conference on Theoretical and Computational Acoustics ICTCA 2007*, M. Taroudakis and P.Papadakis, eds., Heraklion 2008, pp.191-195.
- (2008) (with N.A. Kampanis and J.A. Ekaterinaris) *Effective Computational Methods in Wave Propagation* (editors), Chapman and Hall-CRC Press, Boca Raton 2008.
- (2008) (with D. Mitsotakis) Theory and numerical analysis of Boussinesq systems: A review, *ibid*, pp. 63-110.
- (2008) (with D.A. Mitsoudis and N.A. Kampanis) Finite element discretization of the Helmholtz equation in an underwater acoustic waveguide, *ibid*, pp. 113-134.
- (2008) (with N.A. Kampanis, F. Sturm, and G.E. Zouraris) Numerical solution of the Parabolic Equation in range-dependent waveguides, *ibid*, pp. 175-207.
- (2008) (with D.Antonopoulou, F.Sturm, and G.Zouraris) Conservative initial-boundary value problems for the Wide-Angle PE in waveguides with variable bottoms, in the *Proceedings of the 9<sup>th</sup> European Conference on Underwater Acoustics*, M.E.Zakharia, D.Cassereau, and F.Luppe, eds., Paris 2008, vol. 1, pp. 375-380.
- (2008) (with G.A. Athanassoulis, K.A. Belibassakis, D.A. Mitsoudis and N.A. Kampanis ) Coupled mode and finite element approximations of underwater sound propagation problems In general stratified environments, *J.Comp.Acoustics*, v.16, pp.83-116.
- (2008) (with J.L.Bona and D.E.Mitsotakis) Numerical solution of KdV-KdV systems of Boussinesq equations : II Generation and evolution of radiating solitary waves, *Nonlinearity* v. 21, pp. 2825-2848.
- (2008) (with N. Chrysoulakis, E. Flouri, E. Diamantakis, C.E Synolakis and S. Foteinis) Remote sensing in support of tsunami mitigation planning in the Mediterranean, in the

- Proceedings of the 1<sup>st</sup> International Conference on Remote Sensing Techniques in Disaster Management and Emergency Response in the Mediterranean Region*, M. Oluic and I. Gusic, eds., EARSEL, Geosat, Zagreb 2008, pp. 255-266.
- (2009) (with D. Mitsotakis and J.-C. Saut) On initial-boundary value problems for a Boussinesq system of BBM-BBM type in a plane domain *J. of Discrete and Continuous Dynamical Systems* v. 23, pp. 1191-1204.
  - (2009) (with D.C. Antonopoulos and D.E. Mitsotakis) Initial-boundary-value problems for the Bona-Smith family of Boussinesq systems, *Advances in Differential Equations*, v.14 (2009) pp.27-53.
  - (2009) (with F. Sturm and G.E. Zouraris) On an initial-boundary value problem for a wide-angle parabolic equation in a waveguide with a variable bottom, *Mathematical Methods in the Applied Sciences*, v.32, pp. 1519-1540.
  - (2009) (with D.C. Antonopoulou and G.E. Zouraris) Galerkin methods for parabolic and Schrodinger equations with dynamical boundary conditions and applications to underwater acoustics, *SIAM J. Numer. Anal.* , v.47, pp.2752-2781.
  - (2010) (with D.C.Antonopoulos and D.E.Mitsotakis) Numerical solution of Boussinesq systems of the Bona-Smith family, *Appl. Numer. Math.*, v.60, pp. 314-336.
  - (2010) (with D.E.Mitsotakis and J.- C. Saut) Boussinesq systems of Bona-Smith type on plane domains: Theory and numerical analysis, *J. of Scientific Computing*, v.44, pp.109-135.
  - (2010) (with D.C.Antonopoulos and D.E. Mitsotakis) Galerkin approximations of periodic solutions of Boussinesq systems, *Bull. Greek Math. Soc.*, v.57, pp.13-30.
  - (2012) (with D.C. Antonopoulos) Numerical solution of the ‘classical’ Boussinesq system, *Math. and Computers in Simulation*, v.82, pp.984-1007.
  - (2012) (with A.Duran and D.E. Mitsotakis) Computation of solitary waves of the generalized Benjamin equation. (*Proceedings of the 12<sup>th</sup> International Conference on Computational and Mathematical Methods in Science and Engineering, CCMMSE 2012, Murcia, Spain, July 2012, J.Vigo-Aguiar ed.,vol. 2, pp.487-498*).
  - (2013) (with D.C.Antonopoulos) Error estimates for Galerkin approximations of the ‘classical’ Boussinesq system, *Math.Comp.* v.82, pp.689-717. (Extended version in *arXiv: 1008. 4248*).
  - (2013) (with D.C.Antonopoulou and G.E. Zouraris) A finite difference method for the wide-angle ‘parabolic’ equation in a waveguide with downsloping bottom, *Num.Meth.PDEs*, v.29, pp. 1416-1440.
  - (2014) (with D.C.Antonopoulos) Error estimates for finite element methods for the shallow water equations, in the *Proceedings of NumAn2014-Sixth Conference on Numerical Analysis*, Chania, Greece, Sept 2014, ed. by G.Akrivis *et al.*, pp.13-16.
  - (2014) (with E.T.Flouri and C.E.Synolakis) Tsunami hazard and inundation for the northern coast of Crete, *ibid*, pp. 108-111.
  - (2015) (with A.Duran and D.E. Mitsotakis) Numerical solution of the Benjamin equation, *Wave Motion* v.52, pp.194-215. (Extended version in *arXiv: 1310.2749*).
  - (2016) (with D.C.Antonopoulos) Error estimates for the standard Galerkin-finite element method for the Shallow Water equations,*Math. Comp.*v.85, pp.1143-1182. (Extended version in *arXiv: 1403.5699*).
  - (2016) (with A.Duran and D.E. Mitsotakis) Numerical approximation of solitary waves of the Benjamin equation, *Math. and Computers in Simulation*, v. 127, pp.56-79, [dx.doi.org/10.1016/j.matcom.2012.07.008](https://doi.org/10.1016/j.matcom.2012.07.008)
  - (2017) (with D.C. Antonopoulos) Galerkin-finite element methods for the Shallow Water equations with characteristic boundary conditions, *IMA J. of Numerical Analysis*, v.37,pp. 266-295. (Extended version in *arXiv: 1507.08209*.)
  - (2017) (With D.C.Antonopoulos and D.E.Mitsotakis) Error estimates for Galerkin

approximations of the Serre equations, *SIAM J.Numer. Anal.*, v.55, pp.841-868, also *arXiv : 1701.00668*.

- (2018) (With E.T.Flouri and C.E.Synolakis) Numerical modelling of tsunamis and tsunami vulnerability analysis for Heraklion, Crete, *Math.Meth.Appl.Sci.* , v. 41, pp.1068-1073.

### **Papers at Press and Manuscripts Submitted for Publication**

- (With A. Duran and D.E.Mitsotakis) Numerical approximation to Benjamin type equations. Generation and stability of solitary waves. ( To appear in *Wave Motion* ; see also *arXiv:1712.00485*.)
- (With D.C.Antonopoulos and D.E.Mitsotakis) Error estimates for Galerkin finite element methods for the Camassa-Holm equation. (To appear; see also *arXiv:1805.10744*.)
- (With D.C.Antonopoulos and G.Kounadis) On the standard Galerkin method with explicit RK4 time stepping for the Shallow Water equations. (To appear; see also *arXiv:1810.11008*.)
- (With G.Kounadis) Galerkin finite element methods for the shallow water equations over variable bottom.(To appear; see also *arXiv:1901.04230*).

### **Unpublished Reports and Lecture Notes**

- (1976) High order fully discrete Galerkin approximations to hyperbolic equations, Ph.D. Thesis, Harvard University, (Advisor: Garrett Birkhoff).
- (1978) Finite difference methods for the numerical solution of partial differential equations (Lecture notes for a graduate-level course, University of Tennessee).
- (1978) Finite element methods for the numerical solution of partial differential equations (Lecture notes for a graduate-level course, University of Tennessee, University of Crete; revised 1985, National Technical University; revised 1995, University of Athens; last revised 2013).
- (1980) (with M. D. Gunzburger) Lecture Notes in Numerical Analysis (Lecture notes for a graduate-level course, University of Tennessee).
- (1983) Lecture Notes for Numerical Analysis II (In Greek; University of Crete).
- (1984) Lecture Notes for Numerical Analysis I (In Greek; University of Crete).
- (1986) Lecture Notes on computer solutions of linear systems of equations (In Greek; University of Crete).
- (1987) Numerical solution of the generalized Korteweg-de Vries equation (In Greek; Proceedings of the 1st Mathematics Conference, University of Athens, Sept. 1987).
- (1987) Numerical Analysis (In Greek; Lecture notes for a graduate-level course, University of Crete).
- (1990) Lecture Notes for Mathematical Models of Classical Physics (in Greek; University of Crete, University of Athens, revised, 2000).
- (1991) (with G. D. Akrivis and N. Kampanis) Efficient finite element methods for problems with interfaces in Underwater Acoustics (Invited paper in the 13<sup>th</sup> IMACS World Congress, Dublin, July 1991).
- (1997) (with G. D. Akrivis) Numerical methods for differential equations. (In Greek; Lecture notes), Athens-Ioannina.
- (1999) (with A. Hadjidimos, P. Noutsos and E. Vavalis) Numerical Linear Algebra. (In Greek; Lecture Notes), Ioannina.

- (2018) ( With A.Duran) Semidiscrete approximation to Benjamin-type equations ( *arXiv: 1803.01019*).

**Work on Research and Development Grants** (last 10 years)

- Principal Investigator of the project “Revision of the undergraduate program of studies of the Department of Mathematics of the University of Athens” (EPEAEK II project), 2002-2008, 238.9 k€
- Principal Investigator of the Project “Excellence in Research Institutes-Research Infrastructure of IACM”, GSRT, 2005-2008, 866 k€.
- Senior Investigator in the Project “TRANSFER: Tsunami Risk and Strategies for the European Region”, FP6 STREP Contract No. 037058, 2006-2009, IACM-FORTH.
- Principal Investigator of the Project “Analysis and Numerical Methods for Linear and Nonlinear Wave problems”, Greek-French joint research and technology program, GSRT, 2006-2008, 12,4 k€.
- Principal Investigator of the Project “Modelling of tsunami generation, propagation and inundation with applications in the Aegean Sea”, Greek-Turkish joint research and technology program, GSRT, 2012-13, 15 k€.
- Senior Investigator in the project PEFYKA (KRIPIS) Research Institutes Development Proposals, NSRF (ESPA) 2007-2013, IACM-FORTH.
- Principal Investigator of the project Environment in the framework of the “Programmatic agreement between Research Centers - GSRT 2015-2017”, funded by Siemens S.A., 170 k€, IACM-FORTH.
- Senior Investigator in the project PERAN, NSRF (ESPA) 2014-2020, IACM-FORTH, 2018-

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