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Research Interests

Methods and Equations of Mathematical Physics.
Schrödinger operator and Quantum theory.
Linear and Nonlinear Differential equations. Integrable Models.

Education

Ph.D. Mathematics- Dokuz Eylül University, (September 1998 -21 February 2003).
Thesis: "*Asymptotic Formulas for the Eigenvalues of the Multidimensional Schrödinger Operator*"
Adv: O. Veliev

M.A. Mathematics- Dokuz Eylül University, (September 1996 - June 1998).
Thesis: "*On the Inverse Dirichlet Problem*"
Adv: O. Veliev

B.S. Mathematics- Dokuz Eylül University, (September 1992 - June 1996).

Professional Experience

Prof. Dr. Izmir Institute of Technology, Faculty of Science (IYTE), Mathematics Dept.

Assoc. Prof. Dr. Izmir Institute of Technology, Faculty of Science, Mathematics Dept.
(December 2012-2018)

Assist. Prof. Dr. Izmir Institute of Technology, Faculty of Science, Mathematics Dept.
(October 2006-December 2012)

Lecturer Dr. Izmir Institute of Technology, Faculty of Science, Mathematics Dept.
(March 2003-October 2006).

Lecturer. Izmir Institute of Technology, Faculty of Science, Mathematics Dept.
(October 1999 - March 2003).

Res. Assistant. Dokuz Eylül University, Faculty of Art and Science, Mathematics Dept.
(October 1997 - September 1999)

Research Projects

1. BAP, 2008IYTE32, 2009-2011, "*Quantum Teorisinde Saçılmalı Parametrik Osilatörün Sıfır ve Tekil Noktalarının Dinamikleri*".
2. TÜBİTAK, TBAG, Project No: 110T679, 2011-2013. "*Tam çözülebilen q -diferansiyel ve değişken parametrelili sonsuz Burgers hiyerarşi modelleri*".
3. TÜBİTAK, MFAG, Project No: 116F206, 2017-2019 "*Genel Dispersiyona Sahip Doğrusal Olmayan İntegrallenebilen Sistemler ve Dinamik Kuantum Simetrileri*"

Teaching

Undergraduate Courses:

1. Calculus I, II
2. Differential Equations
3. Linear Algebra
4. Analysis
5. Introduction to Integral equations
6. Linear and Nonlinear Waves

Graduate Courses:

1. Hilbert space theory with Applications
2. Functional Analysis
3. Advanced Linear Algebra
4. Topics in Applied Mathematics
5. Partial Differential Equations
6. Introduction to Spectral theory
7. Mathematical Models of Nonlinear Waves

Master Students

1. Aylin Bozacı, Mathematics, IYTE, 2013-2016.
2. Zehra Çayıç, Mathematics, IYTE, 2013-2016.
3. Osman Çetintaş, Mathematics, IYTE, 2016-2019.

Ph.D. Students

1. Aylin Bozacı, Mathematics, IYTE, 2016-.
2. Zehra Çayıç, Mathematics, IYTE, 2016-.

Publications

Journal Articles

1. "Asymptotic Formulas for the Eigenvalues of the Schrödinger Operator", **Turk. J. Math.**, 26, 215-227 (2002), Şirin Atılğan, Sedef Karakılıç , Oktay A. Veliev.
2. "Asymptotic Formulas for the Resonance Eigenvalues of the Schrödinger Operator", **Turk. J. Math.**, 29, 323-347 (2005), S. Karakılıç, O.A. Veliev, Ş. Atılğan.
3. "Asymptotic Formulas for the Schrödinger Operator with Dirichlet and Neumann Boundary Conditions", **Rep. Math. Phys.**, Vol.55, No:2.,221-239, (2005), S. Karakılıç, Ş. Atılğan, O.A. Veliev.
4. "Exactly Solvable Quantum Sturm-Liouville Problems", **J. Math. Phys.** 50, 072102, (2009), Ş. A. Büyükaşık, O. K. Pashaev, E. Tigrak-Ulaş.
5. "Madelung representation of damped parametric quantum oscillator and exactly solvable Schrödinger-Burgers equations ", **J. Math. Phys.** 51, 122108, (2010), Şirin A. Büyükaşık, Oktay K. Pashaev.
6. " Exactly solvable Madelung fluid and complex Burgers equations: a quantum Sturm-Liouville connection", **J. Math. Chem.** 50,2716-2745, DOI 10.1007/s10910-012-0060-4, (2012), Şirin A. Büyükaşık, Oktay K. Pashaev.
7. "Damped parametric oscillator and exactly solvable complex Burgers equations", QTS7, **Journal of Physics: Conf. Series** 343 (2012) 012020 doi:10.1088/1742-6596/343/1/012020, Şirin A. Büyükaşık, Oktay K. Pashaev.
8. " Exact solutions of forced Burgers equations with time variable coefficients", **Commun Nonlinear Sci Numer Simulat**, 18, 1635-1651 (2013), Şirin A. Büyükaşık, Oktay K. Pashaev.
9. "Exact quantization of Cauchy-Euler type forced parametric oscillator," ICQSA, **Journal of Physics: Conf. Series** 766 (2016) 012003 doi:10.1088/1742-6596/766/1/012003, Şirin A. Büyükaşık, Zehra Çayıç.
10. " Exactly solvable Hermite, Laguerre and Jacobi type quantum parametric oscillators, " **J. Math. Phys.** Vol 57, 12, Doi:10.1063/1.4972293, (2016), Şirin A. Büyükaşık, Zehra Çayıç. (Featured)
11. "Squeezing and resonance in a generalized Caldirola-Kanai type quantum parametric oscillator", **J. Math. Phys.** Vol 59, Doi:10.1063/1.5002186, (2016), Şirin A. Büyükaşık.
12. "Dynamics of squeezed states of a generalized quantum parametric oscillator" **J. Phys.: Conf. Ser.** 1194 012018, (2019), Şirin A. Büyükaşık, Zehra Çayıç.
13. "Time-evolution of squeezed coherent states of a generalized quantum parametric oscillator", **J. Math. Phys.** Vol. 60, 062104, DOI: /10.1063/1.5050489 (2019), Şirin A. Büyükaşık, Zehra Çayıç.
14. "Dirichlet problem on the half-line for a forced Burgers equation with time-variable coefficients and exactly solvable models", **Commun. Nonlin. Sci. Numer. Simulat.** 105059, DOI: 10.1016/j.cnsns.2019.105059 (2019), Şirin A. Büyükaşık, Aylin Bozacı.

Conference Presentations

1. "On the Inverse Dirichlet Problem " Analytic and Geometric Methods in Inverse Problems" 25-30 August,2003, Helsinki, Finland.
2. " Workshop on Inverse Spectral Problems", 1-5 September, 2003, Helsinki, Finland.
1. "Different q -oscillators from the generalized factorization method " Proceedings of Int. Workshop " Supersymmetries and Quantum Symmetries ", Joint Institute for Nuclear Research, Dubna, Russia (2003), R.M.Mir- Kasimov, G. Tanoglu, Ş. Atılğan.
- 3 ."Asymptotic Formulas for Eigenvalues of Multidimensional Schrödinger Operator", 7th International Conference on Harmonic Analysis and Partial Differential Equations, 21-25 June,2004, El Escorial, Madrid, Spain.
4. Fourth European Congress of Mathematics, 27 June-July 02, 2004, Stockholm, Sweden.
5. "Exactly Solvable Quantum Sturm-Liouville Problems", 22 April, 2010, Murcia University, Spain.
6. " Madelung Representation and Exactly Solvable Schrödinger-Burgers Equations with Variable Parameters", 3d International Conference on Nonlinear Science and Complexity (NSC10),July 28-31, 2010, Çankaya University, Ankara.
7. Erasmus, Murcia University, 18-25 April, 2010, Murcia, Spain.
7. "Damped parametric oscillator and exactly solvable Schrödinger-Burgers equations", Quantum Theory and Symmetries Conference (QTS7),7-13 August, 2011, Prague, Czech Republic.
8. "Variable parametric quantum oscillators and exactly solvable Schrödinger-Burgers equations", International Workshop on Differential Equations and Applications (WDEA2011), 14-16 September, 2011, Izmir University of Economics.
9. " Exactly solvable variable parametric Madelung fluid and complex Burgers equations ", 05.07.2012, IYTE.
10. "Exactly solvable inhomogeneous variable parametric Burgers equations", 28. Ulusal Matematik Sempozyumu, 7-9 Eylül, 2015, Antalya.
11. "Exact quantization of Cauchy-Euler type forced parametric oscillator", International Conference on Quantum Science and Applications (ICQSA-2016), 25-27 May, 2016, Eskisehir.
12. "Exactly Solvable Laguerre Type Quantum Parametric Oscillator", 8-th international workshop WDEA 2017, 2-4 June 2017, Izmir.
13. "Dynamics of squeezed states of a generalized quantum parametric oscillator", The 32nd International Colloquium on Group Theoretical Methods in Physics,(Group32), July 9-13, 2018, Prague, Czech Republic.

Honors

Dokuz Eylül University, Faculty of Arts and Science, Honor Degree in Mathematics, 1996.

Languages

Turkish, English, Bulgarian, basic Russian.