

Dr. B. Mayil Vaganan

Professor

Department of Applied Mathematics
and Statistics

School of Mathematics



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FIELD OF SPECIALIZATION

- Partial Differential Equations
- Modeling and Simulation

RESEARCH SPECIALIZATION

- Lie Group Invariant Solutions of Nonlinear Hyperbolic and Parabolic PDEs
- Targetted Drug Delivery: Modeling and Simulation

Research Supervision:

Program	Completed	Ongoing
Ph.D.	09	01
M.Phil.	20	03

PROFESSIONAL EXPERIENCE

No	Institution	Position	From (date)	To (date)	Duration
1.	TIFR Center, IISc Campus, Bangalore	Visiting Fellow	01.02.1994	31.07.1994	Six Months
2	Madurai KamarajUniversityColl ege, Madurai	Lecturer	19.10.94	25.8.95	Eight Months
3.	Pondicherry Engineering College Puducherry	Lecturer	15.9.95	26.4.99	Three Years and Five Months
4.	Madurai KamarajUniversity, Madurai	Reader	28.4.99	27.4.07	Eight Years
5.	Madurai KamarajUniversity, Madurai	Professor	28.4.07	Till date	Till date

RESEARCH COLLABORATION (BOTH NATIONAL & INTERNATIONAL)

Name of the Collaborator	Institute	Collaboration Details	Collaboration Output
Prof. B. O. Enflo	Department of mechanics, Royal Institute of Technology, Stockholm, Sweden	Research Collaboration	01 paper
Prof. K. T. Joseph	TIFR Centre for	Research	01 paper

	Applicable Mathematics, Bangalore	Collaboration	
Prof. V. Philip (Since Retired)	National Institute of Technology (Formerly Regional Engineering College), Calicut	Research Collaboration	01 paper
Prof. S. Sundar	Indian Institute of Technology Madras, Chennai	Research Collaboration	01 paper
Dr. Ch. Srinivasa Rao	Indian Institute of Technology Madras, Chennai	Research Collaboration	01 paper
Prof. Poonam Goyal	Department of Computer Science and Information Sysytems, Birla Institute of Technology & Sciences, Pilani	Research Collaboration	01 paper
Dr. D. Pandiaraja	Thiagarajar College, Madurai	Research Collaboration	01 paper

COMPLETED RESEARCH PROJECT

No	Title of the Project	Funding Agency	Total Grant in Rs.	Year
1	Mathematical Modeling, Computer-Aided Simulation and Visualization of Targeted Drug Delivery System	UGC under UPE Program	4,60,000	2007- 2012

ON-GOING RESEARCH PROJECT: Nil

HONORS/AWARDS/RECOGNITIONS

- **IISc Scholarship** for a Ph. D. Program at Indian Institute of Science, Bangalore from August 31, 1988 to December 31, 1994.
- **Gold Medal**, Best Out-going Science Student, N.G.M. College, Pollachi-642001, 1986.

PUBLICATIONS

International

1. B. Mayil Vaganan and T. ShanmugaPriya, Exact Analytic, Regular Perturbation and Numerical Solutions of Symmetry Reductions of a (2+1)-dimensional KdV-Burgers Equation, *Nonlinear Analysis: Real World Applications*, DOI:10.1016/j.nonrwa.2012.09.005
2. B. Mayil Vaganan, Cole-Hopf Transformations for Higher Dimensional Burgers Equations with Variable Coefficients, *Stud. Appl. Math.* DOI:10.1111/j.1467—9590.2012.00551.x, 2012.
3. B. Mayil Vaganan and N. Muthumari, Symmetry Classifications and Reductions of $(u_t + u^nu_x + \alpha u_{xxx} + (j / 2t) u)_x + \beta u_{yy} = 0$, *International Journal of Applied Mathematics*, Vol. **24 (5)**: 653-662, 2011.
4. B. Mayil Vaganan and T. Jeyalakshmi, Generalized Burgers Equations Transformable to the Burgers Equation, *Studies in Applied Mathematics*, **127**: 211—220, 2011.
5. M. Senthilkumaran, D. Pandiaraja and B. Mayil Vaganan, Exact and explicit solutions of Euler-Painleve equations through generalized Cole-Hopf transformations, *Applied Mathematics and Computation*, **217** (2010) 3412—3416, DOI:10.1016/j.amc.2010.09.007
6. D. Pandiaraja and B. Mayil Vaganan, Group Analysis for the Generalized Kadomtsev-Petviashvili Equation, *International Journal of Computational and Applied Mathematics*, **5(3)**: pp. 415 – 421 (2010).

7. B. Mayil Vaganan and S. Padmasekaran, Large time asymptotics for periodic solutions of nonplanar Burgers equation with linear damping, *Stud. Appl. Maths.***124** (1): 1 – 18 (2009)
8. B. MayilVaganan and T. Jeyalaksmi, Symmetry Classifications and reductions of Generalized KP and Burgers Equations, *International Journal of Applied Mathematics*, **22** (6): 913 -923 (2009)
9. B. MayilVaganan and M. SenthilKumaran, Exact Linearization and Invariant Solutions of a Generalized Burgers Equation with Variable Viscosity, *International Journal of Applied Mathematics and Statistics*, **14**: 97-103 (2009)
10. B. Mayil Vaganan and J. K. Subashini, Nonclassical symmetries via compatibility conditions for nonlinear hyperbolic equations, *International Journal of Applied Mathematics*, 2008.
11. B. Mayil Vaganan and S. Padmasekaran, Exact Solutions of Some Nonlinear Equations by Homogeneous Balance Method, *International Journal of Applied Mathematics*, **21** (2):257 – 263, 2008.
12. M. Senthilkumaran, D. Pandiaraja and B. Mayil Vaganan, New exact explicit solutions of the generalized KdV equations, *Applied Mathematics and Computation*, **202(2)** (2008) 693-699, doi:10.1016/j.amc.2008.03.013
13. P. L. Sachdev, B. Mayil Vaganan and G. Sivagami, Symmetries And Large Time Asymptotics of Compressible Euler Flows With Damping, *Stud. Appl. Math.*, **120**: 105-128, 2008.
14. B. Mayil Vaganan, M. SenthilKumaran, Kummer function solutions of damped Burgers equations with time-dependent viscosity by exact linearization, *Nonlinear Anal.: Real World Appl.* **9**: 2222 – 2233 (2008), doi: 10.1016/j.nonrwa.2007.08.001
15. B. Mayil Vaganan and S. Padmasekaran, Large-time asymptotics for periodic solutions of nonplanar Burgers equation with linear damping, *International Journal of Pure and Applied Mathematics*, **41**: 301 – 316, 2007.
16. B. Mayil Vaganan and M. SenthilKumaran, Exact Linearization and Invariant solutions of the

Generalized Burgers Equation with Linear Damping and Variable Viscosity, *Stud. Appl. Math.* 119: 95-108, 2006.

17. B. Mayil Vaganan and R. Asokan, Direct Similarity Analysis of Generalized Burgers Equations And Perturbation Solutions Of Euler-Painlevé Transcendents, *Stud. Appl. Math.* 111:437-453, 2003.
18. P. L. Sachdev, B. O. Enflo, Ch. Srinivasa Rao, B. Mayil Vaganan and Poonam Goyal, Large-Time Asymptotics for Periodic Solutions of Some Generalized Burgers Equations, *Stud. Appl. Math.* 110:181-204, 2003.
19. B. Mayil Vaganan and M. SenthilKumaran, Similarity Solutions of the Burgers Equation with Linear Damping, *Appl. Math. Lett.*, 17 : 1191-1196, 2003.
20. P. L. Sachdev , K. T. Joseph and B. Mayil Vaganan, Exact N-wave Solutions of Generalized Burgers Equations, *Stud. Appl. Math.*, 97:349-367, 1997.
21. P. L. Sachdev, S. Dowerah, B. Mayil Vaganan and V. Philip, Exact Analysis of a Partial Differential Equation of Gasdynamics, *Quart. Appl. Math.*, LV: 201-229, 1997.
22. P. L. Sachdev and B. Mayil Vaganan, On Mapping of Solutions of Nonlinear Partial Differential Equations, *Nonlinear World*, 1:171-189, 1995.
23. P. L. Sachdev and B. Mayil Vaganan, Exact Free Surface Flows for Shallow Water Equations: Part II, The Compressible Case, *Stud. Appl. Math.*, 94:57-76, 1995.
24. P. L. Sachdev and B. Mayil Vaganan, Exact Free Surface Flows for Shallow Water Equations: Part I, The Incompressible Case, *Stud. Appl. Math.*, 93:251-274, 1994.
25. P. L. Sachdev and B. Mayil Vaganan, Exact Solutions of Linear Partial Differential Equations with Variable Coefficients, *Stud. Appl. Math.*, 87:213-237, 1992.

National

1. B. Mayil Vaganan and E. Emily Priya, Generalized Cole–Hopf transformations for generalized Burgers equations, *{\it Pramana}*: Volume **{\bf 85}**, Issue 5 (2015), Page 861-867.
2. B. Mayil Vaganan, M. Senthilkumaran and T. ShanmugaPriya, A generalized Cole-Hopf transformation for a two-dimensional Burgers equation with a variable coefficient, *Indian Journal of Pure and Applied Mathematics*, **43** (6): 1 – 10 (2012)
3. B. Mayil Vaganan and G. Sivagami, Similarity solutions of unsteady transonic small disturbance equations, *Bull. Marathwada Math. Soc.* **6**(1): 61-68, 2005.
4. B. Mayil Vaganan and M. Senthilkumaran, Direct Similarity Solutions of the Burgers Equation with Variable Viscosity, *Indian J. Pure Appl. Math.*, **34** : 1645-1669, 2003.

Conference Proceedings

1. Vaganan, B. Mayil, Sundar, S., Pandiaraja, D. and Priya, E. Emily, Cauchy-Euler model, cellular automata simulation of the rate of recovery of the infected airway from COPD, Pages:337—341, International Conference on Pattern Recognition, Informatics and Medical Engineering (PRIME 2012), 21-23 March 2012, Salem, India. Print ISBN: 978-1-4673-1037-6 & DOI: 10.1109/ICPRIME.2012.6208368
2. B. Mayil Vaganan and S. V. Gomathy, A direct Cole-Hopf transformation of a generalized Burgers equation with variable viscosity to second order linear ordinary differential equation, *Mathematical Sciences: International Research Journal*, (Eds: D. B. Ratnakar, M. Lellis Thivagar, Pankaj Srivastava), pp.4-6, IMRF Publications, Andhra Pradesh, India, 2016.
3. B. Mayil Vaganan and N. Muthumari, Approximate analytic solutions and exact numerical solutions of $(u_t + uu_x - \epsilon u_{xx})_x + u_{yy} = 0$, *Differential Equations and Applications*, (Ed: P. Prakash), pp. 161-172, Narosa Publishing House, New Delhi, 2014
4. B. Mayil Vaganan and T. ShanmugaPriya, Painleve analysis, Backlund and Cole-Hopf transformation of the (2+1) and (3+1)-dimensional Burgers equations, *Differential Equations and Applications*, (Ed: P. Prakash), pp. 228-232, Narosa Publishing House, New Delhi, 2014

5. B. Mayil Vaganan, A new reduction of the nonplanar Burgers equation and exact analysis of the reduced ordinary differential equation, *Nonlinear Systems* (Eds: R. Sahadevan and M. Lakshmanan), pp.171-178, Narosa Publishing House, New Delhi, 2002.
6. B. Mayil Vaganan and J. K. Subasini, Expansion of non-homentropic, perfect gas in unsteady rectilinear flows in Lagrangian coordinates, *Modeling and Simulation: Life Sciences, Materials and Technology*, pp.237-250, Narosa Publishing House, New Delhi, 2004. (Eds: A. Avudainayagam, P. Misra and S. Sundar)
7. Mayil Vaganan and R. Asokan, Symbolic computation of similarity solutions of the nonlinear Madelung fluid equations with external potential, *Computational Mathematics*, pp:68-73, Narosa Publishing House, New Delhi, 2005. (Eds: K. Thangavel and P. Balasubramaniam).
8. B. Mayil Vaganan and J. K. Subasini, Exponential and Algebraic Solutions Describing Unsteady Rectilinear Flows of Non-homentropic, Perfect Gas, pp.1-15, Narosa Publishing House, New Delhi, 2006. (Ed: B. Mayil Vaganan).
9. B. Mayil Vaganan and M. SenthilKumaran, Invariant Solutions of the Generalized Burgers Equation with Variable Viscosity, pp.19-29, Narosa Publishing House, New Delhi, 2006. (Ed: B. Mayil Vaganan).
10. B. Mayil Vaganan and R. Asokan, Invariant Solutions of a Nonlocal Gaseous Ignition, pp.36-41, Narosa Publishing House, New Delhi, 2006. (Ed: B. Mayil Vaganan).
11. B. Mayil Vaganan and S. Padmasekaran, Large-time Asymptotics for Periodic Solutions of Modified Nonplanar and Modified Nonplanar Damped Burgers Equyations, pp.50-59, Narosa Publishing House, New Delhi, 2006. (Ed: B. Mayil Vaganan).
12. B. Mayil Vaganan and G. Sivagami, Exact Similarity Solutions for a Semilinear Dissipative Wave Equation, pp.71-79, Narosa Publishing House, New Delhi, 2006. (Ed: B. Mayil Vaganan).
13. B. Mayil Vaganan, Transformations Between Burgers Equations, pp.80-88, Narosa Publishing House, New Delhi, 2006. (Ed: B. Mayil Vaganan).

Conference Proceedings Edited

B. Mayil Vaganan (Editor), Nonlinear Waves and Diffusion Processes, Nonlinear Waves and Diffusion Processes, Narosa Publishing House, New Delhi, 2006.

CONFERENCE/WORKSHOP/SEMINAR/TRAINING ORGANIZED

Type	Name	Date(s)	Place	Role Played	Funding Agency
National Conference	Theory, Computation and Application of Differential Equations	March 11-12, 2010	SoM, MKU	Organizing Secretary	UGC under CAS
National Conference	Nonlinear Waves and Diffusion	November 12-13, 2003	SoM, MKU	Organizing Secretary	UGC under I

MEMBERSHIP IN ACADEMIC BODIES

- The Academic Council, Madurai Kamaraj University
 - Senate, Madurai Kamaraj University
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MEMBERSHIP IN PROFESSIONAL BODIES: Nil

CONTACT

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