



SOUTH EAST ASIAN MATHEMATICAL SOCIETY

SEAMS SCHOOL PROPOSAL

Mathematical and Numerical Modelling for Wave Dynamics

Institut Teknologi Bandung
1-8 June 2016

Organized by

Industrial & Financial Mathematics Research Group
Institut Teknologi Bandung

2015

SEAMS SCHOOL PROPOSAL

1. The proposed title, place and dates of the SEAMS School

Title of the SEAMS School	: Mathematical and Numerical Modelling for Wave Dynamics
Place	: Institut Teknologi Bandung
Dates	: 1-8 June 2016

2. Organizers (write the names, place of work, and email address, if you have more than two then add the necessary lines)

1. Name	: Sri Redjeki Pudjaprasetya
Institution	: Institut Teknologi Bandung
Email and Phone	: sr_pudjap@math.itb.ac.id
2. Name	: Leo Harry Wiryanto
Institution	: Institut Teknologi Bandung
Email and Phone	: leo@math.itb.ac.id
3. Name	: Ikha Magdalena
Institution	: Institut Teknologi Bandung
Email and Phone	: ikha.magdalena@math.itb.ac.id

3. Short Description of the **Scientific Content**, the **Aim** of the proposed school and the potential **Impact** to the local academic system and/or society. (max 100 words)

<p>The aim of this school is to introduce the students to the basic knowledge for understanding wave phenomena. In the simulation aspects, two numerical approaches will be discussed, and those are finite difference and finite element methods. Its applications on tsunami propagation is also explored. The school will focus on the following courses :</p> <ol style="list-style-type: none">1. Mathematical modeling for geophysical flows, scaling etc., by Prof. Dr. E. van Groesen.2. Finite Element method for Boussinesq equations, by Dr. Didit Aditya3. Classical and variational formulation of partial differential equations, by Prof. Marian P. Rouge4. Numerical finite volume scheme for shallow water equations, by Dr. Sudi Mungkasi.5. Numerical finite difference scheme for various wave simulations, by Prof. Dr. Sri Redjeki P.6. Finite difference scheme for Boussinesq equation, by Prof. Dr. Leo H. Wiryanto <p>Moreover, the students will be introduced to the active area of researches in this field.</p>
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4. The speakers of the school (name, address, email, male/female). Give the percentage of female speakers.

Lecturers for this workshops are listed below

1. Prof. Dr. E. van Groesen, Labmath Indonesia, Bandung, Indonesia
groesen@labmath-indonesia.org, E.W.C.vanGroesen@utwente.nl
2. Dr. Didit Aditya, Labmath Indonesia, Bandung, Indonesia
didit@labmath-indonesia.org
3. Prof. Dr. Marian P Rouqe, Mathematics Dept., University of Diliman,
marian.rouque11@gmail.com
4. Dr. Sudi Mungkasi, Mathematics Dept., Sanata Dharma, Jogjakarta,
sudi@usd.ac.id
5. Prof. Dr. Sri Redjeki P, Mathematics Dept., Institut Teknologi Bandung,
sr_pudjap@math.itb.ac.id
6. Prof. Dr. Leo H. Wiryanto, Mathematics Dept., Institut Teknologi Bandung,
leo@math.itb.ac.id

Two lecturers Prof. Marian and Prof. Sri Redjeki are female, which means 33% of lecturers are female.

5. Describe in a few lines the local institution related to this school, including the main academic program and its strengths in teaching program and research. Give also the internet site of the local institutions. Do you plan to have a website of this SEAMS school?

This SEAMS school will be organized by our group, the Industrial and Financial Mathematics research group. This group is one of the 15 research groups in the Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung. Members of this group are applied mathematicians working in four different research areas: financial, optimization and control, population dynamics, and fluid dynamics.

This activity will be directly related to the fluid dynamic section. Staff members in this fluid dynamic section are actively doing researches in hydrodynamic, nonlinear waves, and multiphase flows.

In the Undergraduate and Master Programs in Mathematics at ITB we are responsible for teaching courses: Differential Equations, an Introduction, Partial Differential Equations, and Computational Fluid Dynamics. Also, for the course Topics in Applied Mathematics, we offer the following topics: Variational Calculus, Asymptotic expansion method, and Hydrodynamics.

There will be a website for this SEAMS school, and we expect the web will be ready by the end of Nov 2015. This SEAMS school website will be attached on our research group website: <http://ifm.math.itb.ac.id>

6. Provide information on the number and distribution of expected participants. Give the percentage of female participants who will attend the school.

The proposed SEAMS School is expected to serve final-year undergraduate, masters, and first-year PhD students in Mathematics. We expect a total number of 20 students from Indonesia, and 10 participants from other Asian countries, especially from South East Asian countries like Vietnam, Philippines, Malaysia, Thailand, Singapore, etc.

7. Describe the objectives and the program of the proposed school, including the courses (max 5 courses), speakers (in each course), abstracts (8 lines for each course) and tentative schedule of the whole proposed school.

Objectives of the School

1. To introduce students to the fundamental theories and research in wave dynamics and the common numerical methods: finite difference, finite volume, and finite element.
2. To provide young researchers with knowledge and background to start their research in nonlinear waves.
3. To facilitate contacts between mathematicians working in these areas and the students coming to the school.

The following are short description about the courses:

1. Numerical finite difference scheme for various wave simulations

Lecturer: Prof. Dr. Sri Redjeki P.

The finite difference method is the most common numerical tool, with an advantage of simplicity. In this course, students will be guided to implement this method for simulation of various flow problems. Discussion start from the simplest transport equation, by which standard numerical pre-requisite like stability, accuracy, and numerical error will be recalled. The final target will be finite difference for the shallow water equation (the linear and possibly nonlinear).

2. Classical and variational formulation of partial differential equations

Lecturer: Prof. Dr. Marian P. Rouqe

Discussion on the evolution equations for wave dynamics is strongly related to the governing partial differential equations. Very often, choices for the approximate methods like finite element, finite difference, or finite volume, depends strongly on the type of the equations. Therefore, understanding physical properties of the equations will play a central role.

3. Mathematical modeling for geophysical flows and variational structure of HAWASSI

Lecturer: Prof. Dr. E. van Groesen.

Geophysical flow is a very complex subject. In the study of specific phenomena one need to apply simplification. One way to do that is through scaling, or dimensional calculus, which will be discussed in the course. Further discussion will be about variational structure of the HAWASSI software, and some detail about the spatial-spectral (Analytic Boussinesq).

4. Finite Element method for Boussinesq equations

Lecturer: Dr. Didit Aditya

The principle of finite element method will be resumed in this course. This method is originated from a variational problem in a weak formulation. In the lab session, the students will be guided to implement the method for solving the one-dimensional Boussinesq equation.

5. Finite difference scheme for Boussinesq equations

Lecturer: Prof. Dr. Leo H. Wiryanto

Solving the Boussinesq equations is not obvious at all. It is because the equation contains nonlinearity and dispersion. In this course, a finite difference approximation for solve the Boussinesq equations will be discussed, and propagation of the undisturbed soliton will be simulated.

6. Numerical finite volume scheme for shallow water equations

Lecturer: Dr. Sudi Mungkasi

Many fluid flow problems are arisen from conservation laws, therefore the finite volume method is really suitable. In this course, students will be guided to implement this method for solving the shallow water equations. By the end of the course, we hope that students can distinguish what are the strength and weaknesses of the above approximate methods.

Schedule

Hour	Wed, 1-6-'16	Thurs 2-6-'16	Fri 3-6-'16	Sat 4-6-'16	Sun 5-6-'16	Mon 6-6-'16	Tue 7-6-'16	Wed 8-6-'16
08.00-08.15	Opening				E X C U R S I O N			
08.15-10.00 (1 hour 45 min)	Sri R	Marian	EvG	LHW		Sri R	Sudi	Sudi
10.00-10.30	break	break	break	break		break	break	break
10.30-12.15 (1 hour 45 min)	Marian	Lab Session (Marian)	EvG	Lab Session (LHW)		Lab Session (Sri R)	Lab Session (Sudi)	Lab Session (Sudi)
12.15-13.15	Lunch	Lunch	Lunch	Lunch		Lunch	Lunch	Lunch Closing
13.15-15.00 (1 hour 45 min)	Marian	EvG	Didit	Didit		LHW	Seminar	C i t y T O U R
15.00-15.30	break	break	break	break		break	break	
15.30-17.15 (1 hour 45 min)	Lab Session (Sri R)	Lab Session (EvG)	Lab Session (Didit)	Lab Session (Didit)		Lab Session (LHW)	Seminar	

1. Sri R.: Numerical finite difference scheme for various wave simulations, lecturer: Prof. Dr. Sri R. Pudjaprasetya.
2. Marian: The classical and variational pde, lecturer: Prof. Prof. Marian P. Rouge.
3. EvG: Mathematical modeling for geophysical flows, variational structure behind HAWASSI software, Prof. Dr. E. van Groesen.
4. Didiet: The basic FEM and VBM method in HAWASSI software, lecturer: Dr. Didiet Aditya.
5. LHW: Finite difference scheme for KdV equation, lecturer: Prof. Dr. L. H. Wiryanto.
6. Sudi: Numerical finite volume scheme for shallow water equations, lecturer: Dr. Sudi Mungkasi
7. Seminar: by PhD/master students or participants, which is voluntary, but participants of the School will be encouraged to present their researches.

7. Provide information about provisional budget and the expected funding.

Provisional Budget

No	Item	Details	Sources		Total
			CIMPA	Others	
1	Tickets				
	Overseas Participants	10 persons	3400		3400
	Overseas speakers	1 person	250		250
	Local speakers	1 Indonesian speakers from other city	100		100
2	Accommodation				
	Participants	10-15 persons-9 days For overseas participants, & Indonesian participants from other city		2090	2090
	Speakers	1person--9 days	150		120
	Indonesian speakers	1 Indonesian speakers from other city	150		120
3	Food Expenses				
		Lunch+2 snacks during school:7days	950		1000
		school dinner		160	160
4	Local Transport				
	Car rental			150	150
5	Supplies and Printings				
		Program,lecture notes and Kits		100	100
6	Living Expenses for overseas participants				
7	Social program (Excursion)				
				500	500
	TOTAL		5000	3000	8000

Note: At least 2/3 of **CIMPA support** can be used for travel, accommodation and/or living expenses of young researchers (less than 38 or recent PhD) from neighbouring countries of the activity; at most 1/3 at most can be used for lecturers (economy class travel and/or standard living expenses).

CIMPA support cannot be used for: reimbursements for participants living in developed countries (even if their nationality is from a developing country); registration fees; proceedings; organizational expenses.

Expected Funding

No	Item	Confirmed (Yes/Not Yet)	Total
1	CIMPA	Yes	5000
2	Faculty of Mathematics & Natural Sciences	Not Yet	910
3	EFRaCC project	Yes	2090
	TOTAL		8000

8. Provide CVs for the organizers (**2 pages max** for **each person**, including current publications).

CURRICULUM VITAE



Prof. Dr. Sri Redjeki Pudjaprasetya

Industrial and Financial Mathematics Research Group,
Fac. of Mathematics and Natural Sciences, Institut Teknologi Bandung
Ganesha 10, Bandung, 40132, Indonesia

Email: sr_pudjap@math.itb.ac.id

Telp: 62-022-2502545 (ext. 201)

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Education

1992-1996 : PhD mathematics, Universiteit Twente, the Netherlands

1988-1990 : S2 mathematics, Institut Teknologi Bandung

1983-1988 : S1 mathematics, Institut Teknologi Bandung

Research interest:

Nonlinear waves, Numerical modeling of flow and transport, computational fluid dynamics, conservative scheme.

Teaching:

Differential Equations, Partial Differential Equations, Numerical Partial Differential Equations, Calculus, Calculus Multivariables, Variational Calculus

Publications (the last five years):

1. P.H. Gunawan, S.R. Pudjaprasetya, Staggered conservative scheme for rotating shallow water equations on geostrophic flows, submitted
2. I. Magdalena, S.R. Pudjaprasetya, Numerical Modeling for Gravity Waves Over Submerged Porous Media, submitted to Math. Models and Methods in Appl. Sci., August 15, 2014
3. S.S. Tjandra, S.R. Pudjaprasetya, L.H. Wiryanto, Analytical Solutions for Surface Wave Generated by Bottom Motion, JIMS A, 2015.
4. P.H. Gunawan, R. Eymard, S.R. Pudjaprasetya, Explicit staggered grid scheme for the Exner-shallow water equations, Computational Geosciences, Elsevier, 2015.
5. S.S. Tjandra, S.R. Pudjaprasetya, A non-hydrostatic numerical scheme for dispersive waves generated by bottom motion, Wave Motion 57, pp 245-256, (2015) <http://dx.doi.org/10.1016/j.wavemoti.2015.04.008>.
6. I. Magdalena, N. Erwina, S.R. Pudjaprasetya, Staggered momentum conservative scheme for radial dam-break simulation, J. Sci. Comput., Vol. 62 no.3, Feb 2015, DOI 10.1007/s10915-015-9987-5
7. Muliddin, S.R. Pudjaprasetya, S. Hadi, H. Latief, Wave Energy Reduction in Sonneratia sp. Mangrove Forest, *App. Math. Sci.*, Vol. 8, no. 96, 4749 – 4762, (2014), <http://dx.doi.org/10.12988/ams.2014.46462>
8. I. Magdalena, S.R. Pudjaprasetya, L.H. Wiryanto, Wave Interaction with An Emerged Porous Media, *Adv. Appl. Math. Mech.*, Vol. 6, No. 5, pp. 680-692, (2014); <http://dx.doi.org/10.4208/aamm.2014.5.s5>
7. S.R. Pudjaprasetya, S.S. Tjandra, A Hydrodynamic Model for dispersive waves generated by bottom motion, Springer Proc. in Math. & Statistic, FVCA7, Berlin, June 2014.
8. I. Magdalena, S.R. Pudjaprasetya, Numerical Modelling of 2D Wave Refraction and Shoaling, AIP Conf. Proc. **1589**, 480 (2014); <http://dx.doi.org/10.1063/1.4868848>
9. Nugrahinggil Subasita, Hamzah Latief, S.R. Pudjaprasetya, The SWASH Model for Soliton Splitting Due to Decreasing Depth, AIP Conf. Proc. **1589**, 150 (2014); <http://dx.doi.org/10.1063/1.4868771>.
10. Novry Erwina, S.R. Pudjaprasetya, Reflection wave from a sloping beach, AIP Conf. Proc. **1589**, 452 (2014); <http://dx.doi.org/10.1063/1.4868841>
11. Sugih S. Tjandra, S.R. Pudjaprasetya, Natural Frequency of Regular Basin, AIP Conf. Proc. **1589**, 464 (2014); <http://dx.doi.org/10.1063/1.4868844>
12. S.R. Pudjaprasetya, I. Magdalena, Momentum Conservative Scheme for Shallow Water Flows, *East Asian Journal on Applied Mathematics (EAJAM)*, Vol. 4, No. 2, pp. 152-165, (2014), doi: 10.4208/eajam.290913.170314a
13. Rosiana, S.R. Pudjaprasetya, Model Pertumbuhan Populasi dengan Struktur Umur, *IndoMS on JIAM*, Vol. 1, 2014; http://socs.binus.ac.id/files/2014/02/abs6_Issue_1_Jan_14.pdf
14. S.R. Pudjaprasetya, Modeling and Simulation of Waves in Three-Layer Porous Breakwaters, *Nonlin. Processes Geophys.*, Vol. 20, No. 6, 1023-1030, (2013), <http://dx.doi.org/10.5194/npg-20-1023-2013>

15. D. Tarwidi, S.R. Pudjaprasetya, Godunov Method for Stefan Problems with Enthalpy Formulations, *East Asian Journal on Applied Mathematics (EAJAM)*, Vol. 3, No. 2, pp. 107-119, (2013), <http://dx.doi.org/10.4208/eajam.030513.200513a>
16. S.R. Pudjaprasetya, I. Magdalena, 2013, Wave Energy Dissipation in Porous Media, *Applied Mathematical Sciences*, Vol. 7, No. 59, 2925 – 2937; <http://www.m-hikari.com/ams/ams-2013/ams-57-60-2013/magdalenaAMS57-60-2013.pdf>
17. S.R. Pudjaprasetya, E. Khatizah, Longshore Submerged Wave Breaker for Reflecting Beach, *East Asian Journal on Applied Mathematics (EAJAM)* Vol. 2, No. 1, pp. 47-58, 2012, <http://dx.doi.org/10.4208/eajam.050911.300112a>.
18. I. Magdalena, S.R. Pudjaprasetya, Model Gelombang Permukaan di atas Breakwater Berupa Media Berpori, *Seminar Matematika UNPAR*, 2 Oktober 2010.
19. V. Noviantri, S.R. Pudjaprasetya, The Relevance of Wavy Beds as Shoreline Protection, *Proceedings of 13 Asian Computational Fluid Mechanics*, Dhaka, Bangladesh, 2010; <http://http://bsmeicte2012.iutoic-dhaka.edu/proceedings/13th-acfm-2010/contributed/environmentalmechanics/705.pdf>
20. S.R. Pudjaprasetya, A.Y. Gunawan, A traveling pulse behavior of the spread of the avian flu viruses among flock and human, *JIMS-A*, Vol. 16, No.1, 2010; <http://www.jims-a.org/index.php/jimsa/article/view/30>
21. S.R. Pudjaprasetya, Agustinus Ribal, Numerical Solution of Saint Venant Equation to Study Flood in Rivers, *Proceedings of the 5th Asian Mathematical Conference*, Applied Mathematics Vol. II, page 297-301, 2009.

Scientific activities (the last five years):

- 1 Lecturer at SEAMS School, Modelling and simulation for the environmental phenomena, 7-15 September 2015, Sanata Dharma, Jogjakarta.
- 2 Oral Presentation: A non-hydrostatic numerical scheme for transient waves due to antisymmetric seabed thrust, 30-31 Maret 2015, 3rd IMA Conference on Flood Risk, Swansea University, Wales, UK.
- 3 Keynote Speaker: Prinsip Konservasi pada Simulasi Gelombang Air, Seminar Matematika, 20 Sept 2014, UNPAR, Bandung, Indonesia
- 4 Oral Presentation: Traffic Light or Roundabout? 11-13 Juni 2014, KNM 17 ITS, Surabaya
- 5 Oral presentation: Further experience with staggered conservative scheme, EASIAM 23-25 Juni 2014, Pattaya Thailand
- 6 Joint a Workshop on Discrete Soliton, 26-30 Agustus 2013, Mathematics ITB
- 7 Lecture at DAAD Meeting, A Conservative System for Wave Simulations, 11 April 2013, Mathematics ITB.
- 8 Oral presentation: Modeling and Simulation of Waves in Three-Layer Porous Breakwaters 3 layer porous breakwater, Symposium on Water Waves & Ships, 1-6 July 2013.
- 9 General Lecture for exchange students, A Conservative System for Wave Simulations, 21 September 2012, Computational Sciences Double Degree Program, FMIPA ITB
- 10 Oral Presentation at Nonlinear Waves in Fluids, An Efficient Numerical Simulation of Soliton Splitting due to decreasing depth, 11-14 September 2012, Loughborough University
- 11 Joint a Hands-On Researches in Complex Systems, 17-29 June 2012, Jiao Tong University, Shanghai China.
11. Joint a Workshop: Numerical Methods for Differential Equations, 14-20 March 2012, Mathematics ITB.
12. Joint a Workshop: Numerical Simulation for Ocean Dynamics, 16-20 January 2012, Mathematics ITB.
13. Joint: Lecture on Finite Pointset Methods, 14-20 January 2012, Mathematics ITB.
14. Invited lecture on 5th International Conference on Research and Education in Mathematics (ICREM), A Conservative Scheme for Inundation of a dry land simulation, 22-24 October 2011.
15. Guest Lecture at Math. Dept. Okayama University: Reduction of waves in an emerged porous breakwater, 30 June 2010.
16. Oral presentation: Longshore Wave Breaker with Reflected Beach, 7th EASIAM 2011, Waseda University, Japan, 27-29 June 2011.
17. Joint a Workshop 'Coastal and Wave Modelling and Simulation', Labmath Indonesia, January 10-21, 2011.
18. Oral presentation: A Study on Wavy Beds as Shoreline Protection, 13th Asian Congress of Fluid Mechanics, Dhaka, Bangladesh, 16 - 22 Desember 2010
19. Poster presentation: Three-Layer Porous Breakwater, application to mangrove, 2010 Western Pacific Geophysics Meeting, Taipei, Taiwan, 22~25 June, 2010.
20. Oral presentation: Numerical Solution of Saint Venant Equation to Study Flood in Rivers, 5th Asian Mathematical Conference, Kuala Lumpur, Malaysia AMC, June 23-27, 2009.

Awards (the last five years):

1. Partner of Global Innovation Initiative research project with Swansea University, Oct 2014-Oct 2016.
2. Research grant from Desentralisasi ITB DIKTI, project title: Tsunami generation, propagation, and run-up, January- October 2015.
3. Research grant from Faculty of Mathematics and Natural Sciences ITB, project title: Gelombang refleksi pada pantai miring, January- October 2014.
4. Research grant from Desentralisasi ITB DIKTI, project title: Model Konservatif bagi Perambatan Gelombang di Atas Media Berpori Terendam, January- October 2014.

5. Research grant from Faculty of Mathematics and Natural Sciences ITB, project title: Metode Finite Volume bagi Gelombang Internal Soliton, January- October 2013.
6. Research grant from Faculty of Mathematics and Natural Sciences ITB, project title: Pengaruh refleksi dan dispersi pada perambatan gelombang tsunami, January- October 2012.
7. Research grant from program Doktor Unggulan IMHERE-FMIPA ITB, project title: Conserved numerical modeling for near shore hydrodynamics, July 2011 – June 2012
8. Research grant from program Doktor Unggulan IMHERE-FMIPA ITB, project title: Efektivitas dan Dampak Berbagai bentuk penahan gelombang, July 2010 – June 2012
9. Research grant from Ikatan alumni ITB, project title: Modeling and Simulation of shoreline change behind mangrove offshore protection, Juli 2010- April 2011.
10. Research grant from Faculty of Mathematics and Natural Sciences ITB, project title: Efektivitas Breakwater Reefball sebagai Peredam Gelombang, January- October 2010.
11. Research grant from Faculty of Mathematics and Natural Sciences ITB, project title: *Three-layer Porous Media as Wave Breaker, with application on Mangrove Forest.*, January- October 2009.
12. Research grant from Faculty of Mathematics and Natural Sciences ITB (as co-researcher, with Dr. Leo H. Wiryanto), January- October 2009.

Bandung, 26 September 2015



Prof. Dr. Sri Redjeki Pudjaprasetya

Curriculum Vitae



L. Hari Wiryanto

Professor

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Education:

1. B.Sc., Bandung Institute of Technology, 1985
2. Magister, Bandung Institute of Technology, 1988
3. Doctor, University of Adelaide, Australia, 1998

Teaching:

1. Calculus I and II
2. Engineering mathematics I and II
3. Mathematical Numeric
4. Partial Differential Equations
5. Hydrodynamics

Research Interest

1. Free-surface flows
2. Water waves

Publication (Last 5 years)

1. **L.H. Wiryanto**, Unsteady waves generated by flow over permeable bed, Int. J. Applied Maths., 40:4, IJAM 40 4 02, 2010
2. **L.H. Wiryanto** & W. Djohan, A mathematical model of surface waves in a system of two porous layers, Int. J. Applied Math. Stat., v17(j10), June 2010, 116-124
3. **L.H. Wiryanto**, Wave propagation passing over a submerged porous breakwater, J. Eng. Math. DOI 10.1007/s10665-010-9419-3, 70: 129-136, 2011.
4. **L.H. Wiryanto**, Wave Propagation over a Submerged Bar, ITB J. Sci. Vol. 42 A, No. 2, 2010, 81-90.
5. **L.H. Wiryanto**, A Solitary-like wave generated by flow passing a bump Proc. ICMSA, 2010.
6. **L.H. Wiryanto**, J. Wijaya, B. Supriyanto, Free-surface flow under a sluice gate from deep water, Bull. Malay. Math. Sci. Soc., 34(3), 601-609, 2011.
7. **L.H. Wiryanto** & H.B. Supriyanto, The contraction coefficient of a free-surface flow under gravity entering a region beneath a semi-infinite plane, East Asian Journal on Applied Mathematics, doi: 10.4208/eajam.240912.141112a, 2, 342-352, 2012.
8. **L. H. Wiryanto** Numerical solution of a KdV equation, model of a free surface flow, Appl. Math. Sciences, <http://dx.doi.org/10.12988/ams.2014.46404>, 8 (93), 4645-4653, 2014.
9. **L.H. Wiryanto** & S. Mungkasi, A Boussinesq type model for waves generated by flow over a bump, Appl. Math. Sciences,

<http://dx.doi.org/10.12988/ams.2014.47528>, 8 (106), 5293-5302, 2014.

10. I. Magdalena, S. R. Pudjaprasetya, **L.H. Wiryanto**, Wave Interaction with an Emerged Porous Media, *Adv. Appl. Math. Mech.*, 6 (5), 680-692, 2014.
11. **L.H. Wiryanto**, Sudi Mungkasi, Internal monochromatic wave propogating over two bars, *Appl. Math. Sci.*, 9 (90), 4479-4488, 2015.
12. L. H. Wiryanto, M. Jamhuri, Supercritical flow generating a solitary-like wave above a bump, *J. Indust. Appl. Math.*, 2 (1), 1-8, 2015.
13. Lusia K. Budiasih, L. H. Wiryanto, Sudi Mungkasi, Gelombang monochromatic antar muka pada dua lapisan fluida, *J. Indust. Appl. Math.*, 2(1), 9-13, 2015.

Bandung 26 September 2015



L.H. Wiryanto

Curriculum Vitae



Dr. Ikha Magdalena

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Education

2012-2015 : PhD in mathematics, Institut Teknologi Bandung
2010-2012 : S2 mathematics, Institut Teknologi Bandung (GPA 3.79 of 4.00)
2006-2010 : S1 mathematics, Institut Teknologi Bandung (GPA 3.60 of 4.00)

Research interest:

Mathematical and numerical modelling, Fluid dynamics, and Waves.

Publication

1. I. Magdalena. 2015. Non-hydrostatic Model for Undular Hydraulic Jump. IMA Conference Proceeding on Flood Risk.
2. I. Magdalena. 2015. Non-hydrostatic Numerical Modelling for Free Surface Flow, submitted to CICP Journal.
3. I. Magdalena, G.S. Stelling. 2015. A Non-hydrostatic Two-Layer Model for Interfacial Waves, in preparation.
4. I. Magdalena, N. Erwina, S.R. Pudjaprsetya. 2015. Staggered Momentum Conservative Scheme For Radial Dam Break Simulation. Journal of Scientific Computing, Springer. Vol. 62 No.3.
5. I. Magdalena, S.R. Pudjaprasetya, L.H. Wiryanto. 2014. Wave Interaction with Emerged Porous Structure. Advanced in Applied Mathematics and Mechanics, Vol. 6, No. 5, pp. 680-692.
6. I. Magdalena. 2014. Wave attenuation over a submerged porous media. Engineering Mathematics Letter. Vol. 2014.
7. S.R. Pudjaprasetya, I. Magdalena. 2014. Momentum Conservative Scheme for Dam break and Wave Run up Simulations. East Asian Journal on Applied Mathematics, Vol. 4 No. 2, pp. 152-165.
8. S.R. Pudjaprasetya, I. Magdalena. 2013. Wave Energy Dissipation in Porous Media, *Applied Mathematical Sciences*, Vol. 7, no. 59, pp. 2925 - 2937.
9. I. Magdalena, S.R. Pudjaprasetya. 2013. Numerical Modelling of 2D Wave Refraction and Shoaling, *AIP Proceeding of ICMNS*.
10. I. Magdalena, S.R. Pudjaprasetya. 2010. Model Gelombang Permukaan di atas Breakwater Berupa Media Berpori, Prosiding Nasional *Seminar Matematika UNPAR*, 2 Oktober 2010.
11. K.P. Wijaya, I. Magdalena, J. Naiborhu, Trajectory Following Method on Output Tracking of Non-Linear Non-Minimum Phase Systems, AIP Proceeding, 2011.

Conference

- 3rd IMA Confrence on Flood Risk. 30-31 March 2015. Swansea University, UK. "Non-hydrostatic Numerical Model for Undular Hydraulic Jump".
- The 5th International Conference on Scientific Computing and Partial Differential Equations (SCPDE14). 8-12 December 2014. Hongkong Baptist University, Hongkong. "Non-hydrostatic Numerical Modelling for Free Surface Flow".
- Workshop dan Seminar Nasional Matematika dan Pendidikan. 12-13 September 2014. Universitas Sanata Dharma, Yogyakarta, Indonesia. "2DV Non-hydrostatic Numerical Model".
- The 10th EASIAM Conference. 23-25 June 2014. Mahidol University, Thailand. "A Hydrodynamic Scheme for Interfacial Waves".
- The 9th EASIAM-2nd CIAM. 18-20 June 2013. Institut Teknologi Bandung, Indonesia. "Wave Interaction with Emerged Porous Structure"
- The 4th International Conference on Mathematics and Natural Sciences (ICMNS 2012). 8-9 November 2012, Institut Teknologi Bandung, Indonesia. "2D Numerical Modelling of Wave Shoaling and Refraction".
- 7th East Asia SIAM Conference (EASIAM), 27-29 June 2011. Waseda University, Kitakyushu Japan. "Wave Energy Dissipation in Porous Media"
- Seminar Nasional Matematika 2010: "Model Gelombang Permukaan di Atas Breakwater Berupa Media Berpori"

- Conference on Industrial and Applied Mathematics 2010 : "Wave transmission coefficient for monochromatic wave over submerged porous breakwater"
- International Conference Research and Education Mathematics (ICREM 5), Institut Teknologi Bandung : "Trajectory Following Method on Output Tracking of Non-Linear Non-Minimum Phase Systems"

Scientific activities:

1. Participant : Workshop on Modelling and simulation for flood inundations by Prof. Stephen Roberts (Australian National University), 12 September 2014, Universitas Sanata Dharma, Yogyakarta.
2. Participant : Compact Courses on Some Aspects of Interacting Particle Systems by Dr. Torben Fattler (University of Kaiserslautern), 17-19 November 2014, Institut Teknologi Bandung, Indonesia.
3. Committee : SEAMS School on Module Theory and Its Applications. 10-18 November 2014. Institut Teknologi Bandung, Indonesia.
4. Oral presentation at DAAD Meeting, Nepal, Kathmandu University, September 2013.
5. Joint Workshop on Discrete Soliton, 26-30 Agustus 2013
6. Short term visit to Prof. G.S. Stelling, NUS, Singapore, November 2013.
7. Short term visit to Prof. G.S. Stelling, TU Delft, April-August 2012.
8. Doctoral School : Advanced Numerical Methods For Free Surface Hydrodynamics, University of Trento, Italy, January 2013 by Vincenzo Casulli.
9. Joint Workshop : Numerical Method for Ordinary and Partial Differential Equations, 1-15 September 2013, Kathmandu University, Nepal.
10. Joint Workshop: Numerical Methods for Differential Equations, 14-20 March 2012, Mathematics ITB.
11. Joint Workshop: Numerical Simulation for Ocean Dynamics, 16-20 January 2012, Mathematics ITB.
12. Joint: Lecture on Finite Pointset Methods, 14-20 January 2012, Mathematics ITB.
13. Joint Workshop 'Coastal and Wave Modelling and Simulation', Labmath Indonesia, January 10-21, 2011.
14. SEAMS Manila Research School on the Applications of Algebra and Analysis, April 2011, UP Diliman-Philippine.
15. Compact Course On Numerical Optimization, DAAD and Industrial and Financial Mathematics Research Group-Mathematics-ITB.
16. Joint Industrial Mathematics Week, DAAD and Industrial and Financial Mathematics Research Group-Mathematics ITB, 13-17 June 2011.
17. Joint Workshop : The Principles of Quantitative Acoustical Imaging, ITB.
18. Joint Workshop on Optimal Control of Differential Equations, DAAD-ITB.
19. Joint Workshop: Workshop on Mathematics Epidemiology, Math. ITB.
20. Joint Workshop : Numerical PDE, DAAD-Math. ITB.
21. Joint Workshop on Integral and Differential Equations, Math. ITB.

Bandung, November 2015



Ikha Magdalena