國立中山大學
NATIONAL SUN YAT-SEN UNIVERSITY

Joint International Workshop

on

Trefftz Method VI

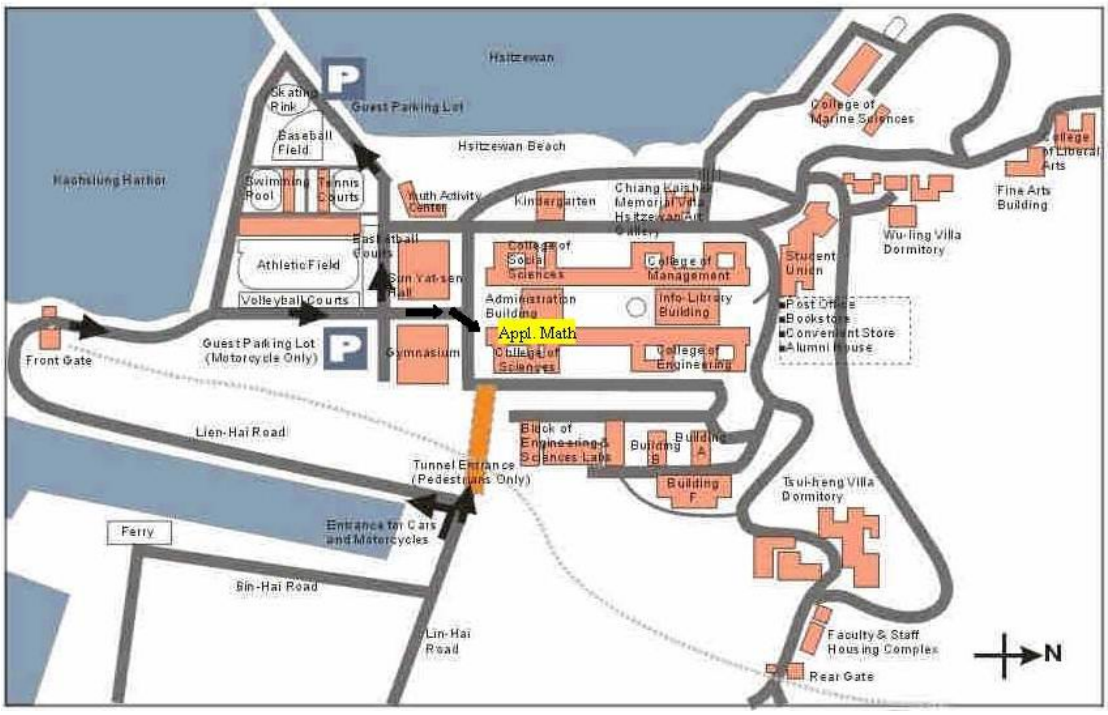
and

Method of Fundamental Solutions II

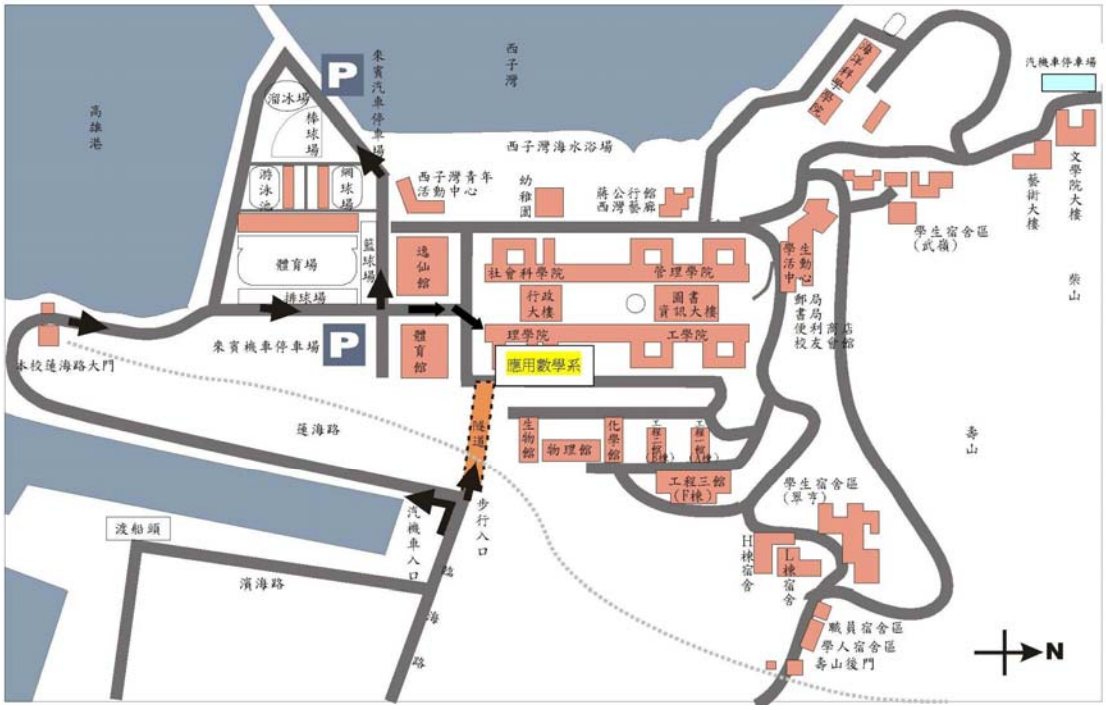
Department of Applied Mathematics
National Sun Yat-sen University
Kaohsiung, Taiwan
March 15-18, 2011

Edited by
Z. C. Li, T. T. Lu, A. H.-D. Cheng
D. L. Young, J. T. Chen, C. S. Chen
and Y. T. Lee

National Sun Yat-sen University Campus Locations

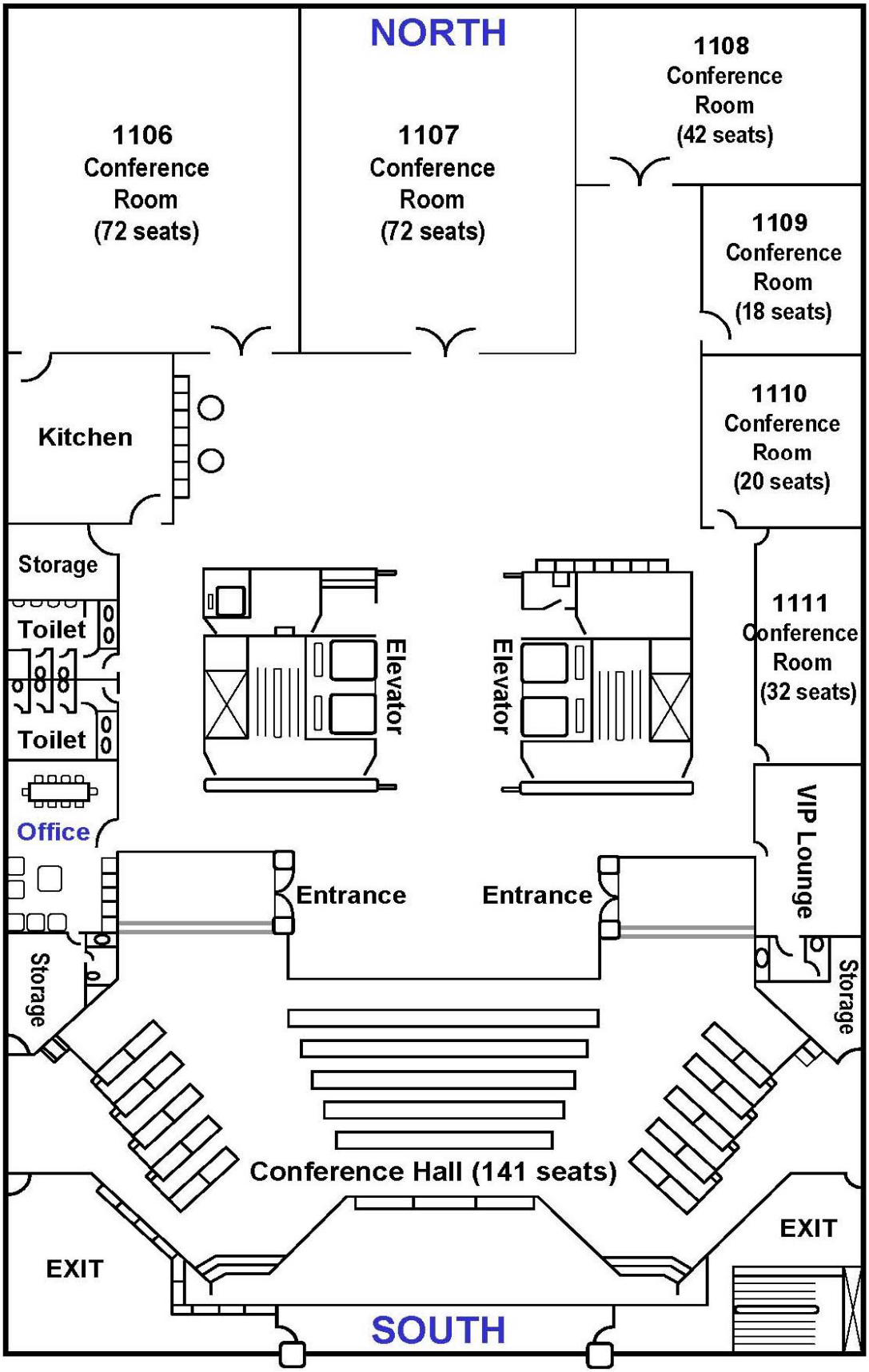


English version



Chinese version

The 11th Floor Plan of Info-Library Building



Program of the Joint Trefftz / MFS Conference 2011

<table>
<tr><th>Time</th><th>March 15 (Tue)</th><th>March 16 (Wed)</th><th>March 17 (Thu)</th><th>March 18 (Fri)</th></tr>
<tr><td>9：00 ~ 9：40</td><td rowspan="2">Registration
Tea / Coffee / Snacks</td><td>Plenary Talk 3</td><td>Plenary Talk 5</td><td>Plenary Talk 6</td></tr>
<tr><td>9：40~10：00</td><td colspan="3">Tea Break</td></tr>
<tr><td>10：00~11：00</td><td>Opening Ceremony
Plenary Talk 1</td><td>Parallel Session 4</td><td>Parallel Session 7</td><td>Parallel Session 9</td></tr>
<tr><td>11：00~11：20</td><td colspan="4">Tea Break</td></tr>
<tr><td>11：20~12：20</td><td>Parallel Session 1</td><td>Parallel Session 5</td><td>Parallel Session 8</td><td>Parallel Session 10</td></tr>
<tr><td>12：20~14：00</td><td colspan="4">Lunch</td></tr>
<tr><td>14：00~14：40</td><td>Plenary Talk 2</td><td>Plenary Talk 4</td><td rowspan="6">Group Photo
City Tour</td><td>Parallel Session 11</td></tr>
<tr><td>14：40~15：00</td><td colspan="2">Tea Break</td><td>Tea Break</td></tr>
<tr><td>15：00~16：00</td><td>Parallel Session 2</td><td>Parallel Session 6</td><td>Parallel Session 12</td></tr>
<tr><td>16：00~16：20</td><td>Tea Break</td><td rowspan="3">Harbor Cruise</td><td>Tea Break</td></tr>
<tr><td>16：20~17：20</td><td>Parallel Session 3</td><td>Parallel Session 13</td></tr>
<tr><td>17：20~18：00</td><td>Music Show</td><td rowspan="2">Shopping</td></tr>
<tr><td>18：00~20：00</td><td>Reception</td><td>Dinner</td><td>Banquet</td></tr>
</table>

★ Parallel sessions include invited and contributed talks. Two sessions hold in the same time. Each talk has 20 minutes.

Program of Plenary Talks

Place: Conference Hall

Plenary Talk 1	**Speaker: I. Herrera**	**Chair: Z. C. Li**
	Unified theory of differential operators acting on discontinuous functions and of matrices acting on discontinuous vectors	
Plenary Talk 2	**Speaker: A. Karageorghis**	**Chair: C. S. Chen**
	The MFS for inverse problems	
Plenary Talk 3	**Speaker: B. Šarler**	**Chair: D. L. Young**
	RBF based solution framework for solving multiphysics and multiscale problems	
Plenary Talk 4	**Speaker: Z. H. Yao**	**Chair: H.-K. Hong**
	Some knowledgegained from my 30 years investigation on boundary element methods	
Plenary Talk 5	**Speaker: R. Schaback**	**Chair: A. H.-D. Cheng**
	Kernel-based meshless methods for solving PDEs	
Plenary Talk 6	**Speaker: A. P. Zielinski**	**Chair: T. T. Lu**
	Miscellaneous open problems in the regular boundary collocation approach	

Brief Program of Invited and Contributed Talks

Place: Conf. Hall	**Place: Room1107**	**Place: Conf. Hall**	**Place: Room1107**	**Place: Conf. Hall**	**Place: Room1107**	**Place: Conf. Hall**	**Place: Room1107**
Parallel Session 1		**Parallel Session 2**		**Parallel Session 3**		**Parallel Session 4**	
Chair: G. R. Liu	***Chair: Q. H. Qin***	***Chair: S. C. Chiang***	***Chair: C. S. Liu***	***Chair: W. C. Yeih***	***Chair: T. L. Horng***	***Chair: E. Kita***	***Chair: K. Grysa***
G. R. Liu #075	Q. H. Qin #026	S. C. Chiang #088	C. S. Liu #020	W. C. Yeih #043	T. L. Horng #049	E. Kita #019	K. Grysa #015
A. Naji #051	W. S. Shyu #048	V. Kompis #027	B. Van Genechten #005	W. Fujisaki #012	Y. T. Lee #045	Y. W. Chen #030	A. GhannadiAsl #003
T. Zhang #072	N. A. Dumont #047	D. C. Lo #077	C. L. Kuo #024	L. J. Young #036	J. W. Lee #044	C. Y. Ku #078	W. M. Lee #039
Parallel Session 5		**Parallel Session 6**		**Parallel Session 7**		**Parallel Session 8**	
Chair: *H.-K. Hong*	***Chair: Y. M. Wei***	***Chair: A. Tadeu***	***Chair: H. Power***	***Chair: Y. C. Hon***	***Chair: M. Ciałkowski***	***Chair: J. D. Yau***	***Chair: N. Nishimura***
H.-K. Hong #067	Y. M. Wei #082	A. Tadeu #065	H. Power #079	Y. C. Hon #011	J. A. Kołodziej #009	T. S. Jiang #033	N. Nishimura #087
B. Y. Ding #001	T. Shigeta #074	J. António #066	C. J. Xu #086	M. Mierzwiczak #028	M. Ciałkowski #016	J. D. Yau #034	T. Matsumoto #084
X. P. Xie #069	M. G. Lee #037	C. T. Wu #052	C. H. Hsiao #059	C. M. Fan #038	W. N. Zhang #083	C. M. Fan #040	A. GhannadiAsl #002
Parallel Session 9		**Parallel Session 10**		**Parallel Session 11**		**Parallel Session 12**	
Chair: V. M. A. Leitão	***Chair: J. Sladek***	***Chair: W. Chen***	***Chair: A. Uscilowska***	***Chair: C. C. Tsai***	***Chair:*** *C. S. Huang*	***Chair: C. Gáspár***	***Chair: C. M. Fan***
V. M. A. Leitão #070	J. Sladek #013	A. H.-D. Cheng #061	A. Uscilowska #007	C. C. Tsai #006	C. S. Huang #004	C. Gáspár #008	C. M. Fan #035
L. Ling #085	C. Y. Lin #054	W. Chen #021	C. S. Wu #053	M. H. Gu #055	I. L. Chen #042	Y. M. Zhang #014	X. Wei #068
K. H. Chen #041	T. S. Jiang #032	H. Htike #010				Y. Gu #022	Z. J. Fu #017
Parallel Session 13							
Chair: L. Ling	***Chair: J. A. Kołodziej***						
C. C. Hsiang #063	C. P. Sun #057						
T. F. Chen #062	Y. L. Chan #56						
Y. H. Huang #060	C. H. Chen #058						

Program of Invited and Contributed Talks

Parallel Session 1

Date: 03/15 (Tue) Time: 11:20~12:20 Place: Conf. Hall Chair: *G.R. Liu*

Authors	Title
G. R. Liu	Meshfree methods by weakened weak (W2) formulations
A. Fili A. Naji Y. Duan	Coupling three-field and meshless mixed Galerkin methods using radial basis function to solve parabolic equation
Tie Zhang Zheng Li	Optimal error estimate and superconvergence of the DG method for first-order hyperbolic problems

Date: 03/15 (Tue) Time: 11:20~12:20 Place:Room 1107 Chair: *Q. H. Qin*

Authors	Title
H. Wang Q. H. Qin X. P. Liang	Solving the nonlinear Poisson-type problems with F-Trefftz hybrid finite element model
W. S. Shyu	SH-wave scattering at a semi-cylindrical hill and a semi-cylindrical alluvial basin by hybrid method
N. A. Dumont D. H. Mosqueira	Hybrid finite elements for strain gradient elasticity: theory and patch tests

Parallel Session 2

Date: 03/15 (Tue) Time: 15:00~16:00 Place:Conf. Hall Chair:*S.C. Chiang*

Authors	Title
S. C. Chiang C. J. Tsou	A numerical scheme for a class of singular integro-differential equations with controls
V. Kompiš et al.	Parallel computational models for composites reinforced by short fibers
D. C. Lo C. S. Chen D. L. Young	A new embedding finite element method for viscous incompressible flows with complex immersed boundaries on Cartesian grids

Date: 03/15 (Tue) Time: 15:00~16:00 Place:Room 1107 Chair: *C. S. Liu*

Authors	Title
C. S. Liu	The method of fundamental solutions for solving the backward heat conduction problem with conditioning by a new post-conditioner
B. Van Genechten et al.	An efficient Wave Based Method for solving Helmholtz problems in three-dimensional bounded domains
C. L. Kuo C. S. Liu J. R. Chang	A collocation Trefftz method with a post-conditioner for solving 2D Helmholtz problems in arbitrary domains with high wave numbers

Parallel Session 3

Date: 03/18 (Fri) **Time: 16:20~17:20** **Place: Conf. Hall** **Chair: *W. C. Yeih***

Authors	Title
W. C. Yeih et al.	Solving the stress intensity factor for a planar crack by using the modified multiple-source Trefftz method
W. Fujisaki T. Fujisawa T. Teranishi	Consideration on effectiveness of the MFS to linear notch mechanics
L. J. Young	Some numerical applications in fracture of materials

Date: 03/15 (Tue) **Time: 16:20~17:20** **Place:Room1107** **Chair: *T. L. Horng***

Authors	Title
T. L. Horng	Fast Chebyshev pseudospectral Poisson solver for all kinds of boundary conditions via diagonalization
Y. T. Lee J. T. Chen	Anti-plane shear problems containing several elliptical holes and/or inclusions
J. W. Lee J. T. Chen	Resonance and focusing of an elliptical harbor by using the null-field BIEM

Parallel Session 4

Date: 03/16 (Wed) Time: 10:00~11:00 Place: Conf. Hall Chair: *E. Kita*

Authors	Title
R. Fujiwara N. Sekiya E. Kita	Energy derivative valuation using radial basis function
Y. W. Chen et al.	Numerical simulation of the two-dimensional sloshing problem using a multi-scaling Trefftz method
C. Y. Ku	Radial basis function methods incorporated with a manifold-based exponentially convergent algorithm for solving partial differential equations

Date: 03/16 (Wed) Time: 10:00~11:00 Place:Room1107 Chair: *K. Grysa*

Authors	Title
K. Grysa	Indirect Trefftz method in the non-stationary problems
A. GhannadiAsl	Application of indirect Trefftz boundary method in solving the Helmholtz equation in 2D finite domain
W. M. Lee	The collocation Trefftz method for acoustic scattering by multiple elliptical cylinders

Parallel Session 5

Date: 03/16 (Wed) Time: 11:20~12:20 Place: Conf. Hall Chair:*H.-K. Hong*

Authors	Title
H.-K. Hong	Clifford-valued boundary methods for anisotropic vector potential problems
B. Y. Ding et al.	The coupling solutions of the dynamic partial differential equations and decomposition of a generalized function δ
X. P. Xie L. Chen Y. Wu	Hybrid stress finite volume method for linear elasticity problems

Date: 03/16 (Wed) Time: 11:20~12:20 Place: Room1107 Chair: *Y. M. Wei*

Authors	Title
Yi-Min Wei Tzon-Tzer Lu Hung-Tsai Huang Zi-Cai Li	Effective condition number for weighted linear least squares problems and applications to the Trefftz methods
T. Shigeta D. L. Young	Condition number and the related mathematical study on boundary meshless methods for the laplace equation in an exterior unbounded domain
M. G. Lee Z. C. Li P. C. Chu	Corner and crack singularity of different types of boundary conditions for linear elastostatics and their numerical solutions

Parallel Session 6

Date: 03/16 (Wed) Time: 15:00~16:00 Place: Conf. Hall Chair: *A. Tadeu*

Authors	Title
A. Tadeu I. Castro	Wave propagation involving solid-fluid interaction using a BEM/TBEM and MFS coupling formulation
J. António A. Tadeu	The method of fundamental solutions used to simulate sound wave propagation inside a sound absorbent enclosed space
C. T. Wu D. L. Young	Application of the method of fundamental solutions and the generalized Lagally theorem to the hydrodynamic force on solid body with external singularity

Date: 03/16 (Wed) Time: 15:00~16:00 Place: Room1107 Chair: *H. Power*

Authors	Title
H. Power C. Nieto M. Giraldo	Boundary element solution of Stokes nano-flow between curved surfaces with linear and nonlinear boundary condition
C. J. Xu	An unstructured nodal spectral-element method for the Navier-Stokes equations
C. H. Hsiao D. L. Young	The singularity method: on the motion of a rotating sphere in unsteady Stokes flows

Parallel Session 7

Date: 03/17 (Thu) Time: 10:00~11:00 Place: Conf. Hall Chair: *Y. C. Hon*

Authors	Title
Y. C. Hon M. Li	A localized direct meshless method for ill-posed inverse problems
M. Mierzwiczak	The inverse determination of the thermal contact resistance between components of unidirectionally reinforced composite
H. F. Chan C. M. Fan	The modified collocation Trefftz method and exponentially convergent scalar homotopy algorithm for the inverse boundary determination problem

Date: 03/17 (Thu) Time: 10:00~11:00 Place:Room1107 Chair: *M. Ciałkowski*

Authors	Title
J. A. Kołodziej M. Mierzwiczak	Application of the method of fundamental solutions for inverse problem of determination of the Biot number
M. Ciałkowski J. A. Kołodziej	Solution of inverse design problem of cooling of annulus by the method of fundamental solutions and minimization of intensity of entropy production
W. N. Zhang	An algorithm for Melnikov functions and applications

Parallel Session 8

Date: 03/17 (Thu) Time: 11:20~12:20 Place: Conf. Hall Chair: *J. D. Yau*

Authors	Title
T. S. Jiang Z. L. Jiang J. Kolibal	A new numerical method for one-dimensional time-dependent Schrodinger equation using radial basis functions
S. R. Kuo J. D. Yau	Applications of Trefftz method to torsionally loaded bucking of a circular plate with a center hole
Y. C. Liu et al.	The least squares Trefftz method with external source for the eigenfrequencies of waveguides

Date: 03/17 (Thu) Time: 11:20~12:20 Place:Room1107 Chair: *N. Nishimura*

Authors	Title
N. Nishimura	Calderon preconditioners for periodic FMMs in wave transmission problems
T. Matsumoto et al.	Shape and topology optimizations using BEM and a level set based method
A. GhannadiAsl	A wavelet-Galerkin boundary element method for the 2D Helmholtz problem

Parallel Session 9

Date: 03/18 (Fri) **Time: 10:00~11:00** **Place:Conf. Hall** **Chair: *V.M.A. Leitão***

Authors	Title
V. M. A. Leitão	Flexible local approximations using fundamental solutions
L. Ling	Applicability and optimality of the method of fundamental solutions
C. T. Chen K. H. Chen F. L. Jhone	New estimation technique of the optimal source points location in the method of fundamental solutions for multi-connected problem

Date: 03/18 (Fri) **Time: 10:00~11:00** **Place: Room1107** **Chair: *J. Sladek***

Authors	Title
C. S. Chen J. Sladek	The method of fundamental solutions verse the method of particular solutions
C. Y. Lin M. H. Gu D. L. Young	The localized method of particular solutions for the Burgers' equations via the Cole-Hopf transformation
T. S. Jiang et al.	A new numerical method of particular solutions for one-dimensional time-dependent Schrödinger equations

Parallel Session 10

Date: 03/18 (Fri) **Time: 11:20~12:20** **Place: Conf. Hall** **Chair: *W. Chen***

Authors	Title
A. H.-D. Cheng	Multiquadric and its shape parameter
W. Chen Y. Gu	Recent advances on singular boundary method
H. Htike W. Chen J. J. Yang	Material point method with RBF interpolation

Date: 03/18 (Fri) **Time: 11:20~12:20** **Place:Room1107** **Chair: *A. Uscilowska***

Authors	Title
A. Uscilowska D. Berendt	An implementation of the method of fundamental solutions for the dynamics of a plate large displacement
C. S. Wu D. L. Young	Method of fundamental solutions for the vibroacoustic analysis

Parallel Session 11

Date: 03/18 (Fri) **Time: 14:00~14:40** **Place: Conf. Hall** **Chair: *C. C. Tsai***

Authors	Title
C. C. Tsai P. H. Lin	On the exponential convergence of method of fundamental solutions
M. H. Gu C. Y. Lin D. L. Young	The Eulerian-Lagrangian method of fundamental solutions for the hyperbolic system problem

Date: 03/18 (Fri) **Time: 14:00~14:40** **Place:Room1107** **Chair: *C. S. Huang***

Authors	Title
C. S. Huang C. S. Chen K.-H. Lin	On the shape parameter of the MFS-MPS scheme
I. L. Chen	Interaction of water waves with vertical cylinder using the method of fundamental solutions

Parallel Session 12

Date: 03/18 (Fri) **Time: 15:00~16:00** **Place: Conf. Hall** **Chair: *C. Gáspár***

Authors	Title
C. Gáspár	Regularization techniques for the method of fundamental solutions
Y. M. Zhang W. Z. Qu J. T. Chen	An average source meshless method for solving the potential problems
Y. Gu W. Chen	Investigation on nearly-boundary solutions by singular boundary method

Date: 03/18 (Fri) **Time: 15:00~16:00** **Place: Room1107** **Chair: *C. M. Fan***

Authors	Title
H. H. Li C. M. Fan H. F. Chan	Solving the direct and inverse Stokes problems by the boundary knot method and Laplacian decomposition
X. Wei W. Chen	The boundary knot method for Poisson and inhomogeneous biharmonic problems
Z. J. Fu W. Chen Q. H. Qin	Heat conduction analysis in functionally graded materials by two boundary collocation methods

Parallel Session 13

Date: 03/18 (Fri) **Time: 16:20~17:20** **Place: Conf. Hall** **Chair: *L. Ling***

Authors	Title
C. C. Hsiang D. L. Young	2D Shallow Water Equations by Localized Meshless Methods
T. F. Chen et al.	The local radial basis function differential quadrature method for 1D shallow water equations
Y. H. Huang et al.	Local radial basis function-based differential quadrature method for 2-D free surface problem

Date: 03/18 (Fri) **Time: 16:20~17:20** **Place:Room1107** **Chair: *J. A. Kołodziej***

Authors	Title
D. L. Young C. P. Sun	Pricing options for the jump-diffusion models by the local differential quadrature method
Y. L. Chan et al.	The interpolation techniques based on the local radial basis function differential quadrature method
D. L. Young C. H. Chen	A linear iterative investigation for MFS with EEM to solve the 3D nonhomogeneous diffusion equation

Notes to Presenters

1. When presenting a paper it is essential to consider the type of audience you will be addressing.
2. Having determined your audience the next step is to decide what you want to tell them. In planning your presentation you must first answer the question "***why do I want to talk to these people*?**"
3. Structure your presentation in a similar way to your written paper. First introduce yourself and the presentation, then move to the main body of the paper. Having done that, draw your conclusions and describe future work.
4. The purpose of a presentation is to make the audience want to understand more about your subject. You should assume that people have not read your paper, so you should try to make them want to read it.
5. Prepare well in advance. By preparing early, the presentation experience should go smoothly with less anxiety.
6. Practice your presentation in front of people who do not understand your work.
7. Marketing presentations and product pitches are not acceptable presentations and will receive poor feedback from delegates.

Presenting

8. Under no circumstances should you read your paper. Each slide should contain bullet points and you should speak in complete sentences and paragraphs.
9. Speak to the audience not the screen and the laser pointer.
10. Remember that many of the delegates do not speak English as a first language – Please speak clearly and not too quickly.
11. Accurate timekeeping is essential to ensure the smooth running of the conference. Remember that the time you have been allocated includes time for Q&A. Delegates do not appreciate long presentations and sessions overrunning.
12. Allow 2 minute per slide and remember to pause so the audience can read the whole slide. Don not block part of the slide

Presentation Equipment

13. A computer and LCD projector will be available for your use. If you require other equipment please let us know well in advance and be aware that this may incur an additional charge payable by you. In case of need contact the conference secretariat as soon as possible.

Presentation of your material

14. Your presentation will be greatly enhanced with the use of a good slide show. Your aim should be to make your presentation as easy to follow as possible.
    - Try to use landscape format where possible
    - Use color wherever possible and make sure that the colors can be distinguishable at the back of a large room
    - Spacing makes the rest of the slide easier to read — don't cram your slides full.
    - Avoid putting important information at the bottom of the page. It can be difficult for some people to see the entire screen.
    - Have between 3-5 pints per slide and do not use too many equations.
    - The first slide should have the name of your presentation, your name and the conference name and date. Your organisation's name should be placed at the bottom corner of each slide along with your own name.
    - Remember that a picture or graph is very informative. Check beforehand that our presentation is of good quality and that they can be read from a distance.
    - Try the LCD projector in advance to avoid delays or disruptions.
    - CD Rom or USB sticks are the most common form of media used. Please note that modern laptops do not have a floppy drive anymore.
    - Meet your session Chairman at least 10 minutes before the session starts.