



Updated: Aug. 14, 2012

[Home](#)

Organized By:

Korea Advanced Institute of Science & Technology (KAIST)

Sponsors:



[Introduction](#)

The 2012 World Congress on Advances in Civil, Environmental, and Materials Research (ACEM'12) will be organized by combining the existing international conferences and new series of conferences to meet the demands from participants for more variety in topics and also to provide the first step fusional approach to solve the global problems of energy, water, and environment issues. Six international conferences are organized under the umbrella of the ACEM'12 Congress.

Thus the congress will be a premier international forum that bring together academics and practicing engineers to exchange frontier research results in the fusion technologies in the topics of Civil, Environmental, and Materials Research. You are cordially invited to participate in this interesting event.

[Participating International Conferences](#)

- **The 2012 Int'l Conference on Advances in Wind and Structures (AWAS'12)**, Co-chairs; John Holmes (Australia), C.K. Choi (Korea), Young-Duk Kim (Korea)
- **The 2012 Int'l Conference on Geomechanics and Engineering (IGGE'12)**, Co-chairs; Poul V. Lade (USA), Gopal Madabhushi (UK), Gye-Chun Cho (Korea)
- **The 2012 Int'l Conference on Advances in Coupled Systems Mechanics (ACSM'12)**, Co-chairs; C.K. Choi (Korea), Phillseung Lee (Korea)
- **The 2012 Int'l Conference on Advances in Membrane Water Treatment**

(AMWT'12), Co-chairs; Enrico Drioli (Italy), In S. Kim (Korea)

■ **The 2012 Int'l Conference on Advanced Environmental Science and Technology (AEST'12)**, Co-chairs; Woojin Lee (Korea), Ahmed Abdel-Wahab (Qatar)

■ **The 2012 Int'l Conference on Advances in Materials Research (ICAMR'12)**, Co-chairs; O Ok Park (Korea), Vijay K. Varadan (USA), George Chen (UK)

For more details, please link the conference of your interest.

The Congress

Each conference of the ACEM12 Congress will be independently organized and generally composed of the invited presentations and concurrent sessions. The Congress will be held in association with the Techno-Press journals of Civil, Environmental Engineering, and Materials Science. Some selected papers will be published in one of the Techno-Press journals.

Themes

The Congress will focus on the *“Frontier Fusion Technologies in Civil, Environmental, and Materials Research”*.

Entire topics of the congress are found at the webpages of the conference of your interest; [\[ACEM'12 Themes\]](#)

General Program

For complete program, see the final program ([ACEM12 Program](#) ^{up})

(Sun)	Day One (Mon)	Day Two (Tue)	Day Three (Wed)	Day Four (Thu)
Arrival Registration	Registration			Field Trip
	Opening	Keynote Lectures		
	Keynote			
	Coffee Break			
	Concurrent Sessions			
	Lunch			
	Concurrent Sessions			
	Coffee Break			
	Concurrent Sessions			
	Reception		Banquet	

[Field Trip(Complimentary)] ^{NEW}

On August 30 (Thursday), the field trip goes to the newly constructed Seoul-Inchon Canal which extends 18Km from Seoul to Incheon. The Canal opens a new cruise route for Seoul to the neighboring ports of China, Taiwan, and Japan.

Leaving COEX at 8:00am by bus, the journey arrives at Gimpo Cruise Terminal 09:30am where the Canal Cruise starts, and arrives Incheon Terminal at 10:30am. After having brunch at the Incheon Terminal, you may either go to Incheon Airport (very close) or return to COEX.(11:30am)

The trip is highly recommended for those who leave Korea via afternoon flights (after 2pm), Please do not miss it.



Invited Keynote Lectures

The Congress will be composed of the plenary and semi-plenary presentations and concurrent sessions organized by the individual conferences. A number of world renowned scholars will be invited to give keynote lectures at the plenary/ semi-plenary sessions on a variety of topics of academic and industrial interests. The list of keynote speakers is given below.

[Keynote Speakers] **up**

- Jong Ho Shin (Konkuk Univ., Korea)	- Rethinking the paradigm for the implementation of enhanced infrastructure
- Masaru Matsumoto (Kyoto Univ., Japan)	- The generation mechanism of aerodynamic response of inclined stay cables of cable-stayed bridges, basing on bluff body aerodynamics
- Enrico Drioli (Univ. of Calabria, Italy)	- The modern membrane engineering for a sustainable industrial growth
- Carlos J. Santamarina (Georgia Tech, USA)	- Energy geotechnology

- Poul V Lade (The Catholic Univ. of America, USA)	- Three-dimensional strength of cross-anisotropic sand deposits
- Gopal Madabhushi (Univ. of Cambridge, UK)	- Seismic design of pile foundations
- Woojin Lee (KAIST, Korea)	- Development of integrated water technology
- O Ok Park (KAIST, Korea)	- Nano morphology control in efficient polymer solar cell
- John D Holmes (JDH Consulting, Australia)	- Modern techniques for effective wind load distributions on large roofs

Call for Papers/Submission/Presentation

Those who have interests in the emerging technologies in a wide range of topics of the ACEM'12 Congress are invited to submit one-full-page abstracts to the secretariat of congress. After acceptance of abstracts, the 4~20 page proceedings papers should be submitted or optionally PP sides to be presented at the Conference may be submitted instead of proceeding paper. Both abstracts and proceeding papers should be submitted through the TeMUS (Techno-Press electronic Manuscript Upload System).

[Abstract/Paper Submission Page](#)

For help, write to; [acem12@kaist.ac.kr]

Detailed instructions to prepare the abstracts and proceeding papers will be available in the [[Guidelines for Authors](#)].

Important Dates

The conference will be held during 26-29 August, 2012.
Other important dates are:

April 27, 2012	Deadline of abstract submission
July 23, 2012	Deadline of proceeding paper submission
July 15, 2012	Last day for pre-registration
August 26-29, 2012	Congress

Call for Minisymposium Organizers

Those who are interested in organizing a mini symposium (MS) with papers in the areas of his/her expertise are invited to organize a mini symposium at the ACEM'12. A mini symposium may have a single session or multiple sessions with 5~8 papers each. In case of successful organization, the mini symposium organizer's paper will be considered as an invited paper and he/she will be

provided with a complimentary registration. For more information, the prospective mini symposium organizers should inquire to the congress secretariat.

[\[General Guidelines for Mini Symposium \(MS\) Organizers\]](#)

[Organized Mini Symposia]

MS ID	Organizer(s)	Conf.	MS Title
MS501	Masaru Matsumoto	AWAS	*Flutter of Structure
MS502	Kouji Isogai	AWAS	*Flutter Application
MS504	Md Monwar Hossain	AMWT	*Waste Water treatment or Membranes for Water Treatment
MS505	Guillermo A Narsilio / Ian Johnston	ICGE	*Direct Geothermal Energy: a Geotechnical Perspective
MS506	Hiroyuki Shima / Motohiro Sato	ICAMR	*Geometry-Property Relation in Solids
MS507	Chia-Yuan Chang/ Srinivasa Popuri	AMWT	*Membrane Bioreactors for Wastewater Treatment and/or Bioproduct Recovery
MS509	Jie Zhang / Lulu Zhang Jinhui Li / Limin Zhang	ICGE	*Geotechnical Reliability and Risk Assessment
MS510	Parvez I. Haris	AEST	*Latest Advances in Methods for Removing Arsenic from Water
MS512	Tae Sup Yun	ICGE	*X-ray CT Application in Geotechnical Engineering
MS513	Tong Lin / Liangti Qu	ICAMR	*Nanofibrous Materials for Energy Harvest and Storage
MS514	Ilhan Chang	ICGE	*Bio- and Environmental Geomechanics and Engineering
MS517	Kyoung-hak Hyun / Jong-suk Jung / Jung-min Lee	AEST	*Low Impact Development & Water Cycle Restoration
MS518	Jongdae Kim	AWAS	*Bridge Aero Dynamics
MS519	Saira Riaz / Shahzad Naseem	ICAMR	*Nanomaterials for Photovoltaic Applications
MS520	Saira Riaz / Shahzad Naseem	ICAMR	*Iron Oxide – A Promising Material for Spintronic / Medical Applications
MS521	Aly Mousaad Aly	AWAS	*Wind Effects on Tall Buildings: Response Prediction and Reduction
MS522	Mohamed B. Elgindi / Dongming Wei	ICAMR	*Buckling and Deformation of Power Law Elastics Structures
MS523	Daryl Boggs / John D. Holmes	AWAS	*The use of aerodynamic models, including a high-frequency base balance and integrated pressure measurements, to study the wind design loads on tall buildings
MS524	Warn-Gyu Park / Jin-Rae Cho	AWAS	*Core Technologies for Offshore Wind Turbines
MS525	Jo-Chun Kim	AEST	*Air Monitoring and Management Technology

MS526	A. Gomes Correia	ICGE	*Geomaterials for Transport and Energy Infrastructures
MS527	Joo Yong Lee	ICGE	*Geomechanics and Gas Hydrates
MS528	Yongrae Roh	ICAMR	*Advanced Piezoelectric Materials and Applications

Proceedings

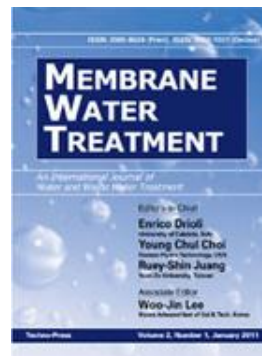
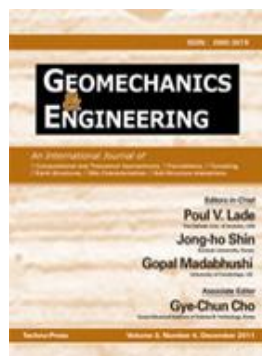
The accepted abstracts of papers to be presented at the congress will be published in the Volume of Abstracts and the conference papers on CD. Only pre-registered papers (done by paying at least 50% of the registration fee) will be included in the proceedings.

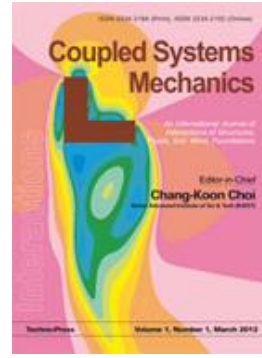
Journal Version Papers

The Congress will be held in association with the Techno-Press Journals of Civil, Mechanical, and Environmental Engineering and Materials Science. Authors are encouraged to submit their Journal version papers (normally 14~20 journal pages) to the relevant Techno Press journals before or after the congress. For information about Techno-Press Journals; [\[Techno Press Journals Webpage\]](#).

The journal version papers should be prepared in accordance with the [\[Instruction to Prepare Manuscript of Techno-Press Journals\]](#). Submitted papers will undergo the peer review process and accepted papers will appear in the journal of your choice.

Associated Journals





Special Issues of 'Techno-Press' Journals

Those who are interested in organizing special issues for the Techno-Press journals are encouraged to contact the congress secretariat for more details. The submitted papers should be peer reviewed and accepted papers will be published in one of the Techno-Press Journals. Some successful mini symposium organizers will be invited to serve as a guest editor for the special issue of the journal of their choice.

For more information, please contact the congress secretariat or link;
[\[Guidelines for Guest Editor\]](#)

Fee and Registration

The registration fee for the congress is US\$700(on or before July 15,2012), and after that date US\$ 750. Only the papers of registered authors are guaranteed to be included in the congress proceedings. For on-site registration, pre-arrangement should be made(US\$800). The fee will cover a copy of congress proceedings, admission to technical sessions, welcome reception, coffee services during session breaks, and congress banquet.

[\[Registration Form\]](#)

Venue

The 2012 ACEM'12 congress will take place at COEX in Seoul, Korea. COEX is the Korea's top venue for International Conventions & Exhibitions. COEX has the space, services, and all the modern technological features for the conferences at the best location of Seoul. The COEX complex accommodates the World Trade Center Seoul, two 5- star hotels, a major department store, and the most popular shopping mall in Seoul.

International Scientific Committee

George Chen (UK)
Gye-Chun Cho (Korea)
Enrico Drioli (Italy)
John Holmes (Australia)
Kouji Isogai (Japan)
In S. Kim (Korea)
Young-Duk Kim (Korea)
Poul V. Lade (USA)

Phillseung Lee (Korea)
Woojin Lee (Korea)
Gopal Madabhushi (UK)
Masaru Matsumoto (Japan)
O Ok Park (Korea)
Vijay K. Varadan (USA)
Ahmed Abdel-Wahab (Qatar)

Local Organizing Committee

Chair: Chang-Koon Choi
Secretary General : Phil-Seung Lee (KAIST)

Members:
Gye-Chun Cho (KAIST)
Hyo-Gyoung Kwak (KAIST)
Woojin Lee (KAIST)
Hyung Jo Jung (KAIST)
O Ok Park (KAIST)

Secretariat

All correspondence should be addressed to :

Secretariat, ACEM'12
c/o TP Conference Consultants
P.O. Box 33, Yuseong,
Daejeon 305-600, Korea
Tel: +82-42-350-8451, Fax: +82-42-350-8450
E-mail: acem12@kaist.ac.kr



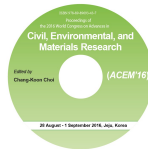
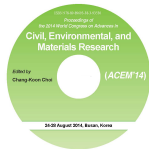
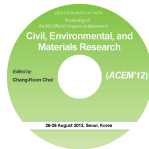
Int'l Assoc. of **Structural Engineering & Mechanics**

(index.php)

ACEM - Proceedings

Print ISBN : 978-89-89693-28-3-93530

Online ISBN : 978-89-89693-42-0-05530



([acem12_publication.html](#)) ([acem14_publication.html](#)) ([acem16_publication.html](#)) ([acem18_publication.html](#))

- **ACEM12 - Proceedings**

at COEX in Seoul Korea, during 26-29 August, 2012.

([acem12_publication.html](#))

- **ACEM14 - Proceedings**

at BEXCO (Busan Exhibition & Convention Center)
Busan Korea, during 24-28 August, 2014.

([acem14_publication.html](#))

- **ACEM16 - Proceedings**

at the International Convention Center Jeju (ICC
Jeju) Korea, during 28 August - 1 September, 2016

([acem16_publication.html](#))

- **ACEM18 - Proceedings**

at Songdo Convensia in Incheon Korea, during 27-
31 August, 2018

([acem18_publication.html](#))

*Note

- The copyright of all papers in the proceedings belong to the authors.
- No work can be reproduced without written permission of the authors.
- Each paper has been peer reviewed by at least two independent reviewers before final acceptance.
- For purchase of printed copy and CD-Rom(USB), please contact info@i-asem.org

2019 IASEM Conferences

P.O. Box 33, Yuseong, Daejeon 34186, Korea Tel: +82-42-828-7995 Fax : +82-42-828-7997 Email: info@i-asem.org



The 2012 World Congress on Advances in Civil, Environmental, and Materials Research Proceedings

KEYNOTE PAPERS

Development and implementation of the green infrastructure paradigm
- Based on the Korean River Restoration Projects -

*Jong-ho Shin**

([publication_conf/acem12/Keynote-01.pdf](#))

On galloping instability of stay cables of cable-stayed bridges

*Masaru Matsumoto**

([publication_conf/acem12/Keynote-02.pdf](#))

Three-dimensional strength of cross-anisotropic sand deposits

Poul V. Lade, Eugene J. Van Dyck and Nina M. Rodriguez*

([publication_conf/acem12/Keynote-03.pdf](#))

Modern techniques for effective wind load distributions on large roofs

*John D Holmes**

([publication_conf/acem12/Keynote-04.pdf](#))

Understanding seismic design of pile foundations

*Gopal Madabhushi**

([publication_conf/acem12/Keynote-05.pdf](#))

Development of integrated water technology

Woojin Lee, Sungjun Bae and Youngho Sihn*

([publication_conf/acem12/Keynote-06.pdf](#))

Recent progress in organic solar cells

O Ok Park, Dong Hwan Wang and Jong Hyeok Park*

([publication_conf/acem12/Keynote-07.pdf](#))

CONTRIBUTED PAPERS

SESSION M3A

Static & Dynamic Behaviors of Structures under Wind Loads

High-strength corrosion-resistant steels for resilient elements

Liudmila Maltseva, Tatiana Maltseva, Natalia Ozerets, Valentina Sharapova, Anna Levina, Xenia Khramtsova*

(publication_conf/acem12/M3A-1.pdf)

Wind tunnel test for three co-stayed steel stack flues

Shin Homma, Hiroyuki Wada, Osamu Azumaya, Akihide Hatanaka, Yun-Seok Kim*

(publication_conf/acem12/M3A-2.pdf)

Numerical study of influence of ice location on galloping of an iced conductor

Amir Borna, Wagdi G. Habashi, Ghyslaine McClure*

(publication_conf/acem12/M3A-3.pdf)

An aero-elastic flutter based electromagnetic energy harvester with wind speed augmenting funnel

Jinkyoo Park, Kyoung-Min Kim, Soon-Duck Kwon, Kincho Law, Kincho H. Law*

(publication_conf/acem12/M3A-4.pdf)

Structural behavior analysis of UHPCC hybrid tower for MW super high wind turbine under Rated Wind Load

Xiangguo Wu, Jing Yang, Siyuan Chen, Qun Yu, Sangmook Han*

(publication_conf/acem12/M3A-5.pdf)

SESSION M3B

Composite Materials

Semi-solid forming of Al-Si functionally graded material using hypereutectic Al-Si alloy

Daisaku Nara, Yasuyoshi Fukui*

(publication_conf/acem12/M3B-1.pdf)

Preparation, characterization, and properties of nanofillers based thermoplastic polyurethane nanocomposites

Young-Wook Chang, Aruna Kumar Barick, Ji-Yoen Jung, Deba Kumar Tripathy*

(publication_conf/acem12/M3B-2.pdf)

Novel bubble-containing Ca²⁺ cross-linked alginate composite beads
encapsulating graphene oxide for dye removal

Ling Sun, Hongwen Yu, Bunshi Fugetsu*

(publication_conf/acem12/M3B-3.pdf)

Different metals joining method reinforced by carbon fiber

Sho Ishii, Nobuhiro Harigae, Noriyoshi Miwa, Yoshitake Nishi, Yoshihito Matsumura*

(publication_conf/acem12/M3B-4.pdf)

Effects of electron beam irradiation on impact value of
sandwich structural composite of CFRP/Polymer/CFRP

Naoya Tsuchikura, Shinichiroh Namba, Tatsuya Yamamoto, Yoshitake Nishi,
Michell C. Faudree, Keisuke Iwata*

(publication_conf/acem12/M3B-5.pdf)

Polymer-metal joining method with carbon fiber

Kazuma Shiraishi, Syo Ishii, Atsushi Kasai, Yoshitake Nishi, Yoshihito Matsumura*

(publication_conf/acem12/M3B-6.pdf)

SESSION M3C

X-ray CT Application in Geotechnical Engineering (Tae Sup Yun)

Applications of X-ray CT methods to the analysis of
transitional phenomena in porous media at
X-Earth Center, Kumamoto University

Akira Sato, Minami Kataoka, Hisafumi Asaue, Yuzo Obara*

(publication_conf/acem12/M3C-1.pdf)

Observation of sealing behavior of fracture in cementitious materials
by X-ray CT and SEM-EDX

Megumi Maruyama, Daisuke Fukuda, Ryo Nakabayashi, Katsuhiko Kaneko,
Yoshitaka Nara, Hideo Ogawa*

(publication_conf/acem12/M3C-2.pdf)

Evaluation of air void parameters for hardened concrete paste
using 3D X-ray CT images

*Kwang Yeom Kim, Dong Hun Kang, Tae Sup Yun**

(publication_conf/acem12/M3C-3.pdf)

Image processing techniques relevant to geomaterials

Dong Hun Kang, Tae Sup Yun, Kwang Yeom Kim*

(publication_conf/acem12/M3C-4.pdf)

Analysis of fracture process of rock based on X-ray CT images

Minami Kataoka, Akira Sato, Hisafumi Asaue, Yuzo Obara*

(publication_conf/acem12/M3C-5.pdf)

Three dimensional geometrical information of preexisting pores under poroelastic deformation of Berea Sandstone

Manabu Takahashi, Masaji Kato, Minoru Sato, Xiaochun Li*

(publication_conf/acem12/M3C-6.pdf)

Segmentation of multi-phase X-ray computed tomography images of porous materials considering partial volume effect

Masaji Kato, Hiroshi Yamanaka, Manabu Takahashi, Satoru Kawasaki, Katsuhiko Kaneko*

(publication_conf/acem12/M3C-7.pdf)

Estimation of Coal Substance Liberation using X-ray CT Images

Sang-Ho Cho, Sangsun Jeong, Soobok Jeong, Byoungkon Kim, Kwangyeom Kim, Katsuhiko Kaneko*

(publication_conf/acem12/M3C-8.pdf)

Estimation of porosity of clay from X-ray CT scan

Kwang Yeom Kim, Hyu Soung Shin, Hwayoung Yang*

(publication_conf/acem12/M3C-9.pdf)

SESSION M3D Coupled Systems Dynamics I

Coupling effect on propagation of guided waves in engineering structures and human bone structures

Zhongqing Su, Jiangang Chen, Li Cheng*

(publication_conf/acem12/M3D-1.pdf)

Efficient MBS-FEM integration for structural dynamics

Dragan Z. Marinkovic, Manfred W. Zehn*

(publication_conf/acem12/M3D-2.pdf)

Corrosion monitoring of steel bridge cables

Alexander Tesar, Andrej Jarosevic*

(publication_conf/acem12/M3D-3.pdf)

Semiactive vibration attenuation of a flexible rotor
by squeezing thin layers of normal and magnetorheological oils

Jaroslav Zapomel, Petr Ferfecki*

(publication_conf/acem12/M3D-4.pdf)

Particle swarm optimization based damage detection method
for beam type structures subject to moving vehicle

*Hakan Gokdag**

(publication_conf/acem12/M3D-5.pdf)

An onshore hydro/piezo/electric system and its application to
energy harvesting from sea waves

Gerassimos A. Athanassoulis, Konstantinos I. Mamiis*

(publication_conf/acem12/M3D-6.pdf)

SESSION M3E

Membranes for Water Treatment

Advantages of using the ion-exchange process in NOM removal
prior to water ultrafiltration

Malgorzata Kabsch-Korbutowicz, Agnieszka Urbanowska*

(publication_conf/acem12/M3E-1.pdf)

Two-nozzle electrospinning fabrication of bicomponent
and bimodal nanofibrous mats with antibacterial properties

Leonard D. Tijjing, Michael Tom G. Ruelo, Altangerel Amarjargal, Hem Raj Pant,
Chan-Hee Park, Zhe Jiang, Seung-Ji Kang, Eun-Kyu Kyo, Bo-sang Hwang,
Tae-Hyung Kim, Dong Hwan Lee, Cheol Sang Kim*

(publication_conf/acem12/M3E-2.pdf)

Effects of coagulation pH and mixing conditions
on characteristics of flocs in surface water treatment

Zhun Ma, Jian-Jun Qin, Cui-Xian Liou, Lifeng Zhang, Suresh Valiyaveetil*

(publication_conf/acem12/M3E-3.pdf)

SESSION M3F

Smart and Sustainable Environmental Nano-Science and Technology

Soil remediation: Use of a sprinkling system to wash diesel-polluted soils with microemulsion precursors

Tereza Dantas, Afonso Dantas Neto, Ricardo Leite, Catia Rossi, Fabricio Melo*

(publication_conf/acem12/M3F-1.pdf)

Relationships among soil properties, CO₂ emission and ecosystem respiration in dry Dipterocarp Forest, Western Thailand

Phongthep Hanpattanakit, Montri Sanwangsri, Amnat Chidthaisong*

(publication_conf/acem12/M3F-2.pdf)

Measurements of the medium and low concentration levels of airborne bacteria and fungi by using the new bioaerosol sampler

Jozef Stefan Pastuszka, Piotr Iwasiewicz, Ewa Brągoszewska*

(publication_conf/acem12/M3F-3.pdf)

Development of a fluorescent molecular probe for analysis of zinc ion in aquatic samples

Hisashi Satoh, Akira Hafuka, Koji Yamada, Masahiro Takahashi, Satoshi Okabe*

(publication_conf/acem12/M3F-4.pdf)

Removal of brominated flame-retardants from high-impact polystyrene by extraction in an alkaline organic medium

Guido Grause, Hisatoshi Tanaka, Tomohito Kameda, Toshiaki Yoshioka, Thallada Bhaskar*

(publication_conf/acem12/M3F-5.pdf)

SESSION M4A

Wind Effects on Tall Structures and Wind Energy

Analysis of three dimensional equivalent static wind loads of high-rise buildings based on wind tunnel test

Shuguo Liang, Lianghao Zou, Dahai Wang, Tiehua Xiong*

(publication_conf/acem12/M4A-1.pdf)

Dynamic properties of a tall reinforced concrete tower with tuned liquid dampers

Masaru Kikuchi, Ken Ishii, Yoriko Suzuki*

(publication_conf/acem12/M4A-2.pdf)

Wind tunnel test for rising characteristics of exhaust gases from three flues

Shin Homma, Osamu Azumaya, Hiroyuki Ohtsuka, Akihide Hatanaka,*

Yun-Seok Kim, Yoshihiro Yamaguchi

(publication_conf/acem12/M4A-3.pdf)

Wind pressures on solar panels mounted on residential homes

Aly Mousaad Aly, Girma Bitsuamlak*

(publication_conf/acem12/M4A-4.pdf)

Aerodynamics of ground mounted solar panels: test model scale effects

Aly Mousaad Aly, Girma Bitsuamlak*

(publication_conf/acem12/M4A-5.pdf)

SESSION M5E-II

Nanofibrous Materials for Energy Harvest and Storage (Tong Lin & Liangti Qu)

Three-dimensional analysis of anisotropic elastic plates

*Yoshitaka Suetake**

(publication_conf/acem12/M5E-II-1.pdf)

Carbon nanofibers with inter-bonded fibrous structure for supercapacitor application

*Tong Lin, Xungai Wang, Haitao Niu**

(publication_conf/acem12/M5E-II-2.pdf)

Electrical power generation from randomly-oriented electrospun nanofibrous nonwoven

Tong Lin, Jian Fang, Xungai Wang, Jinhui Lan*

(publication_conf/acem12/M5E-II-3.pdf)

Simulation of a novel piezoelectric energy harvester

*Jinhui Lan, Quanlong Feng, Zhiwu Lu, Shuwei Xiao, Tong Lin**

(publication_conf/acem12/M5E-II-4.pdf)

SESSION M4C

Composite Materials & Structures

Examining K0 and stiffness changes in sand under different loading conditions

*Yan Gao and Yu-Hsing Wang**

(publication_conf/acem12/M4C-1.pdf)

Case study of adjacent metro deformation and countermeasures
for the extra-deep excavation and mega-piles construction

Jian-Jin Qiu, Wei Gao, Zan-Liang Zhou, Bo Liu, Ai-Guo Li, Jian-Hua Yin*

(publication_conf/acem12/M4C-2.pdf)

Fabric of granular materials at the critical state

*Wai Man Yan**

(publication_conf/acem12/M4C-3.pdf)

DEM modeling of the critical-state behavior of a granular material

X. Huang, C.Y. Kwok, C. O'Sullivan, L.G. Tham*

(publication_conf/acem12/M4C-4.pdf)

On the plastic work of crushable soils under compression

Carlos Ovalle, Christophe Dano, Pierre-Yves Hicher*

(publication_conf/acem12/M4C-5.pdf)

Influence of particle shape of hydrophobic granular materials on shear strength

*Jong-Sub Lee, Yong-Hoon Byun**

(publication_conf/acem12/M4C-6.pdf)

Suction controlled saturation processes of buffer material in a deep geological repository

Wei-Hsing Huang, Yi-Fang Chuang*

(publication_conf/acem12/M4C-7.pdf)

Particle shape determination in a sedimaging device

Hyon-Sohk Ohm, Roman D. Hryciw*

(publication_conf/acem12/M4C-8.pdf)

SESSION M4D Coupled Systems Dynamics II

Offshore to nearshore wave spectrum transformation, taking into account wave - current - seabed interaction

Gerassimos A. Athanassoulis, Konstantinos A. Belibassakis, Theodoros P. Gerothathis*

(publication_conf/acem12/M4D-1.pdf)

A coupled soil-pore fluid formulation for modeling soil liquefaction and cyclic mobility in seabed using the finite volume method

Tian Tang, Ole Heddal, Johan Roenby*

(publication_conf/acem12/M4D-2.pdf)

A pragmatic receipt for the stability analysis of solution strategies for coupled multi-field problems

Seyedmohammad Zinatbakhsh, Bernd Markert, Wolfgang Ehlers*

(publication_conf/acem12/M4D-3.pdf)

Dynamic characteristics of multi-functional composite shells
subjected to electromagnetic and thermal fields

Ohseop Song, Sang-Yun Park, Sung-Kyun Kim, Jong-Woon Choi*

(publication_conf/acem12/M4D-4.pdf)

Aerodynamic performance comparison of head shapes for high-speed train at
500KPH

Kai Cui, Xiuping Wang, Shouchao Hu, Taiyuan Gao*

(publication_conf/acem12/M4D-5.pdf)

TLCD systems on non rigid pads

Yoyong Arfiadi, Ade Lisantono*

(publication_conf/acem12/M4D-6.pdf)

SESSION M4E

Water Reuse & Membrane Bioreactors for Wastewater
Treatment

and/or Bioproduct Recovery (Chia-Yuan Chang &
Srinivasa Popuri)

Characteristics of wastewater and mixed liquor and their role in membrane fouling

*M.N. Han, W.J. Gao, X. Qu, C. Xu, B.Q. Liao**

(publication_conf/acem12/M4E-1.pdf)

A vertical membrane bioreactor for water recycling from laboratory to market

So-Ryong Chae, Jin-Ho Chung, Yong-Rok Heo, Eui-Sin Lee, Hang-Sik Shin*

(publication_conf/acem12/M4E-2.pdf)

Characterization of fouling-related organics in MBRs

*Fangang Meng**

(publication_conf/acem12/M4E-3.pdf)

SESSION M4F

Green and Sustainable Environmental

Nutrient recycling from bio-digestion waste as chemical fertilizer substitutes

Céline Vaneekhaute, Erik Meers, Greet Ghekiere, Frederik Accoe Filip M.G.Tack*

(publication_conf/acem12/M4F-1.pdf)

Environmental impact assessment for a Chinese pre-stressed concrete continuous rigid-frame bridge based on LCA

Yuanfeng Wang, Bo Pang, Jie Zhang*

(publication_conf/acem12/M4F-2.pdf)

Inherent overpotential generated by characteristic of microbial fuel cells with multiple membrane electrode assemblies

In Seop Chang, Bongkyu Kim, Junyeong An, Daehee Kim, Taeyoung Kim*

(publication_conf/acem12/M4F-3.pdf)

Effect of Dried Distillers' Grains with Solubles (DDGS) in cattle diets and windrow turning frequency on greenhouse gas emissions during feedlot manure composting

Xiyi Hao, Francis J. Larney, Tim A. McAllister*

(publication_conf/acem12/M4F-4.pdf)

Modelling of the transport and dispersion of oil spill in the sea by particles

Lorenzo Papa, Luca Vattuone*

(publication_conf/acem12/M4F-6.pdf)

SESSION M5A

Core Technologies for Offshore Windturbines I (Warn-Gyu Park & Jin-Rae Cho)

Supporting capacity of short suction anchor based on numerical modeling

Jaehun Ahn, Hanmin Lee*

(publication_conf/acem12/M5A-1.pdf)

Corrosion-protection design for floating-type offshore wind turbines

In-Tae Kim, Seock-Jin Choi, Min-Ho Park*

(publication_conf/acem12/M5A-2.pdf)

Dynamic characteristics of the offshore floating platform with a mooring cable under a linear combination of wind and wave

*Hee Chang Lim, Dan Gu, Young Tae Lee**

(publication_conf/acem12/M5A-3.pdf)

Visualization study of wave generation in a short-distance wave maker

Hee Chang Lim, Eui Chul Jung, Zhen Zhong Yuan*

(publication_conf/acem12/M5A-4.pdf)

Non-reflective boundary treatment for fluid-structure interaction simulation of offshore wind turbine

Jin-Rae Cho, Jeon-Soo Hong, Warn-Gyu Park, Weui-Bong Jeong*

(publication_conf/acem12/M5A-5.pdf)

Parametric investigation of dynamic characteristics of mooring cable of floating-type offshore wind turbine

Weui-Bong Jeong, Yang-uk Cho, Myeong-woo Seo, Jin-Rae Cho*

(publication_conf/acem12/M5A-6.pdf)

Dynamic analysis of 5-MW onshore wind turbine

Kun-Woo Kim, Dae-Guen Lim, Wan-Suk Yoo*

(publication_conf/acem12/M5A-7.pdf)

CFD simulation of wave and current on fixed cylinder

T.J. Kang, Y.H. Park, W.G. Park, J.K. Cho*

(publication_conf/acem12/M5A-8.pdf)

Numerical simulation of flow around forced-rolling barge buoyancy

Warn-Gyu Park, Kyung-Jin Kim, Jang-Keun Cho, Tea-Jin Kang*

(publication_conf/acem12/M5A-9.pdf)

SESSION M5B

Materials and Products

Synthesis and characterization of structural, electrical and magnetic properties of NiO nano-crystallites

Shahid Atiq, Muhammad Javid, Shahzad Naseem*

(publication_conf/acem12/M5B-1.pdf)

Self-cleaning measurements on tiles manufactured with micro-sized photoactive TiO₂

Claudia L. Bianchi, Valentino Capucci, Sara Gatto, Stefano Nucci, Giuseppina Cerrato*

(publication_conf/acem12/M5B-2.pdf)

The effects of foaming agents and modifiers on a foamed-geopolymer

Tsung-Yin Yang, Chia-Ching Chou, Chuan-Chi Chien*

(publication_conf/acem12/M5B-3.pdf)

Minimizing the scattered field of layered acoustic cloak through optimization

Tungyang Chen, Chung-Ning Weng, Wen-Hsiao Chung*

(publication_conf/acem12/M5B-4.pdf)

Design of elastic transformation media
via affine transformation in curvilinear coordinates

*Tungyang Chen, Chung-Ning Weng**

(publication_conf/acem12/M5B-5.pdf)

Flexible IGZO TFTs deposited on PET substrates
using magnetron radio frequency co-sputtering system

Yung-Hao Lin, Wan-Yi Ye, Hsin-Ying Lee, Ching-Ting Lee*

(publication_conf/acem12/M5B-6.pdf)

Dispersion and alignment of MWCNTs in polyurethane
for making flexible and conductive nanofiber by electrospinning

Songmin Shang, Wei Zeng, Xiao-Ming Tao*

(publication_conf/acem12/M5B-7.pdf)

Water absorption induced impact value of thermoplastic polymers

Junhua Quan, Naoya Tsuchikura, Shinichiro Nanba, Masae Kanda, Yoshitake Nishi*

(publication_conf/acem12/M5B-8.pdf)

Processing of porous cordierite via the utilization of
two waste metal oxides (Al-slag and silica fumes)

Yasser M.Z. Ahmed, Emad M.M. Ewais, Amira M.M. Amin*

(publication_conf/acem12/M5B-9.pdf)

SESSION M5C

Computational Geomechanics

Numerical modeling of landslide generated impulse waves

Yee-Chung Jin, Mahtab Mosaffa*

(publication_conf/acem12/M5C-1.pdf)

Examining the soil responses during the initiation of
a flow landslide by coupled numerical simulations

Yiqiang Wang(Hong Kong), Yu-Hsing Wang*

(publication_conf/acem12/M5C-2.pdf)

Realistic generation and packing of DEM sand samples

Guilhem Mollon, Jidong Zhao*

(publication_conf/acem12/M5C-3.pdf)

New methodology to obtain free surfaces in unconfined seepage problems:

The Gasset Dam (Ciudad Real, Spain)

Jaime Peco Culebra, Susana Lopez-Querol*

(publication_conf/acem12/M5C-4.pdf)

Development of meshfree method for slope stability and post-failure analyses

On-Lei Annie Kwok, Pai-Chen Guan, Wei-Po Cheng, Chun-Ting Sun*

(publication_conf/acem12/M5C-5.pdf)

Fluid-coupled analysis using solution mapping and remeshing

Tek Kei Sun, Ryan Wai Man Yan*

(publication_conf/acem12/M5C-6.pdf)

GIS-based numerical simulation of debris flow

Jian Wu, Guangqi Chen, Kiyonobu Kasama, Lu Zheng, Yingbin Zhang*

(publication_conf/acem12/M5C-7.pdf)

SESSION M5D

Coupled Systems Dynamics II

An electromechanically-coupled Bernoulli-Euler beam-theory
taking into account the finite conductivity of the electrodes
for sensing and actuation

Juergen Schoeftner, Gerda Buchberger*

(publication_conf/acem12/M5D-1.pdf)

Coupled vibrations in a thermo-elastic small size scanning probe microscopy array

Dennis Roeser, Stefanie Gutschmidt, Thomas Sattel, Ivo W. Rangelow*

(publication_conf/acem12/M5D-2.pdf)

Comparison of the results from theoretical formula and dynamic analysis of
a seismically isolated structure

Hyunuk Kim, Sanghoon Noh, Sunghan Shim*

(publication_conf/acem12/M5D-3.pdf)

Aircraft impact assessments for a base-isolated nuclear power plant structure

Sanghoon Noh, Hyun-Uk Kim*

(publication_conf/acem12/M5D-4.pdf)

Nonlinearly coupled thermo-electro-mechanics and multi-field FE analysis of
thin-walled structures

Ruediger Schmidt, Mekala N. Rao, Thang Duy Vu*

(publication_conf/acem12/M5D-5.pdf)

Operational response analysis of a tower crane structure
considering crane-payload interaction

Zhi Sun, Zhoutao Duan, Yuxiong Yan*

(publication_conf/acem12/M5D-6.pdf)

A study on thermal deformation of concrete tube structures
for super-speed maglev train system

*Se-Jun Park, Ki-Yong Ko, Sang-Hyo Kim, Won-Ho Heo**

(publication_conf/acem12/M5D-7.pdf)

Air damping induced from the interaction
between a vibrating cantilever and its surroundings

Yun-Che Wang, Chih-Chin Ko, Tien-Shu Chang, Chia-Min Wei*

(publication_conf/acem12/M5D-8.pdf)

SESSION M5E-I

Waste Water Treatment or Membranes for Water Treatment (Md Monwar Hossain)

Solvent extraction of ammonium ions from seawater using sunflower oil

Md Monwar Hossain, Omar Chaallal*

(publication_conf/acem12/M5E-1.pdf)

Treatment of ground waters in a hollow-fibre membrane contactor for removal of
ions

*Md Monwar Hossain**

(publication_conf/acem12/M5E-2.pdf)

Ion transport through diffusion layer controlled by charge mosaic membrane

*Akira Yamauchi**

(publication_conf/acem12/M5E-4.pdf)

SESSION M5F

The use of aerodynamic models, including a high-
frequency base,
balance and integrated pressure (Daryl Boggs & John D.
Holmes)

International high-frequency base balance benchmark study

John Holmes, Tim K.T. Tse*

(publication_conf/acem12/M5F-1.pdf)

SESSION T3A

Flutter of Structure I (Masaru Matsumoto)

Modification of flutter derivatives satisfying the causality condition
for the time-domain aeroelastic analysis

Kilje Jung, Ho-Kyung Kim, Hae Sung Lee*

(publication_conf/acem12/T3A-1.pdf)

Role of Karman vortex on bluff body aerodynamics-vortex-induced vibration

Masaru Matsumoto, Hiroshi Ishizaki, Kotaro Hori*

(publication_conf/acem12/T3A-2.pdf)

Flow pattern around cable and its aerodynamic characteristics
in critical Reynolds number range

Qingkuan Liu, Wenyong Ma, Xiaobing Liu*

(publication_conf/acem12/T3A-3.pdf)

Effect of wind yaw angle on flutter performance of
a truss deck suspension bridge with various aerodynamic measures

Le-Dong Zhu, Zhen-Shan GUO, Xiao Tan*

(publication_conf/acem12/T3A-4.pdf)

Observation of galloping of four-bundled conductors
on ice-accreted overhead transmission lines

Hisato Matsumiya, Takashi Nishihara, Mikio Shimizu, Teruhiro Yukino*

(publication_conf/acem12/T3A-5.pdf)

Identification of flutter derivatives from the forced and free vibration tests
using EEE method

Yunhwa Hong, You Chan Hwang, Kim Ho-Kyung, Lee Hae Sung*

(publication_conf/acem12/T3A-6.pdf)

SESSION T3B

Geomaterials for Transport and Energy Infrastructures (A. Gomes Correia)

Probabilistic numerical modeling of a RCC gravity dam's construction

*Ana Patricia Pimentel Torres Gaspar, Fernando Lopez-Caballero,
Arezou Modaressi, Antonio Gomes Correia**

(publication_conf/acem12/T3B-1.pdf)

Geotechnical issues of megaprojects on problematical soil ground of Kazakhstan

Zhussupbekov Askar Zhagparovich, Lukpanov Rauan Ermagambetovich*

(publication_conf/acem12/T3B-2.pdf)

Innovative fibrous materials for geotechnical applications

Raul Fanguero, Sohel Rana, Antonio Correia*

(publication_conf/acem12/T3B-3.pdf)

SESSION T3C

Geomechanics and Gas Hydrates (Joo Yong Lee)

Investigation of capillarity in gas hydrate deposits with coupled flow and geomechanics

Jihoon Kim, George J. Moridis*

(publication_conf/acem12/T3C-1.pdf)

Electrical and geomechanical properties of natural gas hydrate-bearing sediments from Ulleung Basin, East Sea, Korea

Joo Yong Lee, Jae Hyung Lee, Se Joon Kim, Jae Woong Jung*

(publication_conf/acem12/T3C-2.pdf)

Experimental study on seismic wave velocity of hydrate-bearing fine-grained sediments

Gye-Chun Cho, Hak-Sung Kim, Tae-Hyuk Kwon*

(publication_conf/acem12/T3C-3.pdf)

Stress-dependant characteristics of deep marine sediments recovered from the Ulleung Basin, East Sea, Korea

Changho Lee, Young Moon Kim, Jong-Sub Lee, Joo-Yong Lee*

(publication_conf/acem12/T3C-4.pdf)

Stability analysis of a wellbore in hydrate bearing sediments using PFC3D

*Jae-Joon Song, Jong-Woo Song**

(publication_conf/acem12/T3C-5.pdf)

The effect of swapping speed on methane recovery

in gas hydrate-bearing unconsolidated sediments

Jaehyoung Lee, Dong-Gun Lee, Jong-Se Lim, Joo-Yong Lee*

(publication_conf/acem12/T3C-6.pdf)

SESSION T3D

Fluid-Structures Interaction

Experimental and computational study of underwater shock wave effect on aluminum foam

Zoran Ren, Matej Vesenjak, Matej Borovinsek, Seiichi Irie, Shigeru Itoh*

(publication_conf/acem12/T3D-1.pdf)

Zoran Ren*, Matej Vesenjak, Matej Borovinsek, Seiichi Irie, Shigeru Itoh

*Phill-Seung Lee, Jooseong Yoon**

(publication_conf/acem12/T3D-2.pdf)

3D numerical simulation of wave forces on an offshore wind turbine foundation

Sung-Jin Choi, Kwang-Ho Lee, Ove Tobias Gudmestad*

(publication_conf/acem12/T3D-3.pdf)

Flow-induced vibration of carbon nanopipe with nonlocal effect

Ohseop Song, Jong-Woon Choi, Sung-Kyun Kim*

(publication_conf/acem12/T3D-4.pdf)

Discussions on damage of bridges by tsunami wave of 2011 off the Pacific coast of Tohoku earthquake

*Akira Hasegawa**

(publication_conf/acem12/T3D-5.pdf)

SESSION T3E

Desalination / Membrane / Water Reuse

Continuous ion-exchange membrane electrodialysis for drinking water production: Numerical analysis

*Yoshinobu Tanaka**

(publication_conf/acem12/T3E-1.pdf)

Potential reuse of grey water from mosques for toilet flushing and garden irrigation in Saudi Arabia

Abdulrasoul Alomran, Mohammed Al-Wabel*

(publication_conf/acem12/T3E-3.pdf)

Treatment of organic dye solutions by electrodialysis

*Katarzyna Maria Majewska-Nowak**

(publication_conf/acem12/T3E-4.pdf)

SESSION T3F

Latest Advances in Methods for Removing Arsenic from Water

(Parvez I. Haris)

Sorption of As(V) ion from contaminated water onto activated carbon derived from Palm Bark (PB) biomass: Process parameter optimization and isothermal modeling studies

Suantak Kamsonlian, Shri Chand, C.B. Majumder*

(publication_conf/acem12/T3F-1.pdf)

SESSION T4A

Flutter of Structure II (Masaru Matsumoto)

Estimation of flutter derivatives of various sections using numerical simulation and neural network

Jaeyong Chung, Seonkyu Chang, Seung-Woo Lee, Yunseok Kim*

(publication_conf/acem12/T4A-1.pdf)

Investigation of flutter characteristics of supersonic experimental aircraft

Jiro Nakamichi, Kenichi Saitoh, Masato Tamayama*

(publication_conf/acem12/T4A-2.pdf)

SESSION T4B

Ceramics Materials / Composite Materials / Metals and Alloys

Synthesis and characterization of cellulose-amino functionalized polyhedral oligomeric silsesquioxane (POSS-NH₂)-SiO₂ hybrid nanomaterials

*Joo-Hyung Kim, Ramesh Sivalingam**

(publication_conf/acem12/T4B-1.pdf)

Microstructure and hardness of Fe-TiCN cermets fabricated by powder blending and powder coating routes followed by powder metallurgy process

Walid M. Daoush, Elena Gordo, Paula Alvaredo, El Sayed K. Maree, Sayed Farag Moustafa, Zeinab Abdel Hamid, Ahmed A. Atlam, Amir A. El Sayed*

(publication_conf/acem12/T4B-2.pdf)

Effects of EB-irradiation on temperature dependent peeling resistance of laminated sheet of high strength PP and bio-adaptable PDMS

Masato Uyama, Hidenori Kawazu, Masae Kanda, Hiroaki Takei, Keisuke Iwata, Hiroyuki Kudoh, Kohji Mitsubayashi, Yoshitake Nishi*

(publication_conf/acem12/T4B-3.pdf)

Analysis and design of CFRP steel shear wall composites

Farzad Hatami, Ali Ghamari*

(publication_conf/acem12/T4B-4.pdf)

Research on welding thermal simulation behavior of V-N-Ti and V-Nb-Ti microalloyed steels

Hao Yu, Bing Yang*

(publication_conf/acem12/T4B-5.pdf)

Preparation and properties of multiwalled carbon nanotubes/poly (vinyl chloride) nanocomposites

Khalid Saeed, Nasib Khan*

(publication_conf/acem12/T4B-6.pdf)

SESSION T4C

Geotechnical Reliability and Risk Assessment (Jie Zhang, Lulu Zhang, Jinhui Li & Limin Zhang)

Influence of spatial variability on consolidation of unsaturated soils

Lulu Zhang, Yan Cheng, Lulu Zhang, Zibo Zuo, Jianhua Wang*

(publication_conf/acem12/T4C-1.pdf)

Influence of water content and soil type on soil cracking

Jinhui Li, Lingbo Guo, Chengzhi Cai*

(publication_conf/acem12/T4C-2.pdf)

Reliability based stabilization of failed slopes

Jie Zhang, Yinggang Zhang, Hongwei Huang*

(publication_conf/acem12/T4C-3.pdf)

A novel method for simplified reliability-based code calibration

Jianye Ching, Kok-Kwang Phoon*

(publication_conf/acem12/T4C-4.pdf)

Reliability analysis of block sliding in large brown coal open cuts

Jianfeng Xue, Ali Tolooiyan*

(publication_conf/acem12/T4C-5.pdf)

Strain localization in shear band

Xu Li, Hui Yang*

(publication_conf/acem12/T4C-6.pdf)

SESSION T4D

Polymers / Nanotechnology / Piezoelectric Materials

Miscibility of mixed stereoregular PMMA/PVAc monolayers at the air/water interface

*Wen-Ping Hsu**

(publication_conf/acem12/T4D-1.pdf)

Sub-wavelength heterogeneous laser-induced periodic surface structures

Norbert Hampp, Hee-Cheol Kim, Hendrik Reinhardt, Pierre Hillebrecht*

(publication_conf/acem12/T4D-2.pdf)

Preparation and characterization of Ge/SiO₂ nanocomposite fibers

Seungsin Lee, Jihee Chung*

(publication_conf/acem12/T4D-3.pdf)

Synthesis of silica nanoparticles from silica gel waste and their catalytic role

*Ali Ramazani**

(publication_conf/acem12/T4D-4.pdf)

A quarter-wavelength vibration mode transducer

using clamped boundary backing layer

Seunghye Lee, Kwangyun Choi, Kyungho Lee, Youngshin Kim, Sungsik Park*

(publication_conf/acem12/T4D-6.pdf)

SESSION T4E

Fouling & Membrane Bioreactors

Nanofiltration membrane fouling by aluminum species

transformed with different pH in presence of Ca ion

Yang Hun Choi, Ji Hyang Kweon, Soonbuhm Kwon*

(publication_conf/acem12/T4E-1.pdf)

Characterization of the influence of algal organic matter
on the fouling of a ceramic MF membrane

Linhua Fan, Xiaolei Zhang, Felicity Roddick*

(publication_conf/acem12/T4E-2.pdf)

Electrokinetic characterization of particle deposits
from coupled streaming potential and permeate flux measurements
during dead-end filtration

Patrick Fievet, Yannick Lanteri, Wael Ballout, Sebastien Deon,
Anthony Szymczyk, Patrick Sauvade*

(publication_conf/acem12/T4E-3.pdf)

Numerical and experimental studies on hydrodynamics of
continuous- and pulsed-aerated membrane bioreactors

Chang Wei Kang, Jing Lou*

(publication_conf/acem12/T4E-5.pdf)

SESSION T4F

Advanced Water / Waste Water Treatment I

Flower-like BiOBr microspheres
with enhanced visible-light photocatalytic performances

Yuning Huo, Jia Zhang, Miao Miao, Hexing Li*

(publication_conf/acem12/T4F-1.pdf)

Reactive contact system for arsenic removal
using iron and sulfur-based environment

Bahngmi Jung, Dong-suk Han, Ahmed Khodary, Ahmed Abdel-Wahab*

(publication_conf/acem12/T4F-2.pdf)

Removal of mercury from water using Reactive
Adsorbent/Membrane (RAM) hybrid filtration process

Dong Suk Han, Ahmed Khodary, Bill Batchelor, Ahmed Abdel-Wahab*

(publication_conf/acem12/T4F-3.pdf)

UV light-induced reductive degradation of haloaliphatic compounds

Sun Hee Yoon, Dong Suk Han, Ahmed Khodary, Bill Batchelor, Ahmed Abdel-Wahab*

(publication_conf/acem12/T4F-4.pdf)

Optimization of photocatalytic removal of phenazopyridine an analgesic drug from water using ceramic coated TiO₂ nanoparticles

Alireza Khataee, Mehrangiz Fathinia, Nasrin Nosrati, Farzaneh Farshbaf*

(publication_conf/acem12/T4F-5.pdf)

Photoelectrocatalytic activity of a novel ultrafine CdS-modified TiO₂ nanotube arrays electrode under visible light irradiation

Gui-Sheng Li, Ling Wu, Fang Li, Peng-Peng Xu, Bo Jiang, He-Xing Li*

(publication_conf/acem12/T4F-6.pdf)

SESSION T5A

Flutter Application (Kouji Isogai)

On flag flutter as a two-degree of freedom system

*Hiromasa Kawai**

(publication_conf/acem12/T5A-1.pdf)

Propulsive performance of dolphins

-estimation from analysis of standing swimming-

*Koji Isogai**

(publication_conf/acem12/T5A-2.pdf)

Sailing performance of the ship by wind turbine generator

*Shigemitsu Aoki**

(publication_conf/acem12/T5A-3.pdf)

Experimental study on a three-wing configuration of flapping wing hydroelectric power generator

Hisanori Abiru, Akira Yoshitake*

(publication_conf/acem12/T5A-4.pdf)

Application of wave devouring propulsion system for ocean engineering

*Yutaka Terao, Norimitu Sakagami**

(publication_conf/acem12/T5A-5.pdf)

Modelling and control of long object oscillation in water

Yusuke Morinaga, Ikuo Yamamoto*

(publication_conf/acem12/T5A-6.pdf)

Research and development of robotic fish based on elastic oscillation fin system

Ikuo Yamamoto, Tomokazu Hiratsuka*

(publication_conf/acem12/T5A-7.pdf)

Energy harvesting from aeroelastic flutter

Soon-Duck Kwon, Kyungmin Kim, Seungho Lee*

(publication_conf/acem12/T5A-8.pdf)

SESSION T5B

Metals and Alloys & Multidisciplinary Application of Materials

Properties and application of nanoporous metals fabricated by dealloying

Masataka Hakamada, Junichi Motomura, Satoshi Matsumura,
Fumi Hirashima, Masaki Takahashi, Mamoru Mabuchi*

(publication_conf/acem12/T5B-1.pdf)

Laser brazing molybdenum using two titanium base fillers

Ren-Kae Shiue, Chia-Chen Lin, Cheng-Han Lee, Hsiou-Jeng Shy*

(publication_conf/acem12/T5B-2.pdf)

Brazing inconel 625 for plate heat exchanger

Ren-Kae Shiue, Wen-Shiang Chen*

(publication_conf/acem12/T5B-3.pdf)

Duplex aging of Ti-15V-3Cr-3Sn-3Al alloy

Ying-Kai Chou, Leu-Wen Tsay, Chun Chen*

(publication_conf/acem12/T5B-4.pdf)

Study of microstructure and texture of hot-deformed TXA321 magnesium alloy

C. Dharmendra, K.P. Rao, Y.V.R.K. Prasad, Norbert Hort, Karl Kainer*

(publication_conf/acem12/T5B-5.pdf)

Hot workability of extruded AZ31 magnesium alloy containing 1.5% nano-alumina

Tao Zhong, K.P. Rao, Y.V.R.K. Prasad, M. Gupta*

(publication_conf/acem12/T5B-6.pdf)

Study of structural transformations occurring
in the metal composite after explosion welding

Maltseva L.A., Sharapova V.A., Maltseva T.V., Tushlyayeva D.S.,
Lozkin N.N., Pastukhov M.V.*

(publication_conf/acem12/T5B-7.pdf)

SESSION T5C

Geotechnical Issues I

Centrifuge model test on settlement controlling of
piled raft foundation in high-rise building

Dang Dinh Chung Nguyen, Dong-Soo Kim, Seong-Bae Jo*

(publication_conf/acem12/T5C-1.pdf)

Micro-scale Investigation on kinematic behavior of
particulate medium in response to shearing

Quan Yuan, Pak-On Tam, Xia Li, Yu-Hsing Wang*

(publication_conf/acem12/T5C-2.pdf)

Pressure measurements in a silo backfilled with a cohesionless soil

Li Li, Jonathan Aubertin, Jean-Sebastien Dube*

(publication_conf/acem12/T5C-3.pdf)

Seismic behavior of pile embedded in liquefiable sand deposit

Chung-Jung Lee, Wen-Yi Hung, Wen-Ya Chuang,
Ting Chen, Chen-Hui Tsai, Meng-Hsui Heish*

(publication_conf/acem12/T5C-4.pdf)

Effect of fines content on the small strain stiffness of sand

*Jun Yang, Xin Liu**

(publication_conf/acem12/T5C-5.pdf)

Use of concrete cross walls to reduce movements induced by deep excavation

Chang-Yu Ou, Pio-Go Hsieh, Shao-Chi Chien*

(publication_conf/acem12/T5C-6.pdf)

Nonlinear soil - structure interaction analysis by numerical integration of halfspace

*Radim Cajka**

(publication_conf/acem12/T5C-7.pdf)

Estimation of bearing capacity of saturated and unsaturated sands
from the SPT and CPT correlations

Fathi M.O. Mohamed, Sai Vanapalli*

(publication_conf/acem12/T5C-9.pdf)

SESSION T5D

Multidisciplinary Interactions

Group dynamics of a building cluster: a nonlinear model

Stefanie Gutschmidt, Jason McVicar, Akshay Sridhar*

(publication_conf/acem12/T5D-1.pdf)

Nonlinear dynamic analysis of jackup platforms
considering soil structure interaction

Behrouz Asgarian, Saghy Saeidtehrani, Mohammad Daghigh, Fereidoun Kiaei*

(publication_conf/acem12/T5D-2.pdf)

Effect of pile- soil- structure interaction on dynamic characteristic of
sample jacket type offshore platform
by experimental and numerical investigation

Behrouz Asgarian, Hamed Rahman Shokrgozar,
davoud Shahcheraghi, Hasan Ghasemzadeh*

(publication_conf/acem12/T5D-3.pdf)

Collapsing simulation of wooden house retrofitted
by ACM braces during seismic ground motion

Tomiya Takatani, Hayato Nishikawa*

(publication_conf/acem12/T5D-4.pdf)

Shake table test on uplift behaviour of a shear frame in earthquakes

Nawawi Chouw, Xiaoyang Qin*

(publication_conf/acem12/T5D-5.pdf)

Prestressed beam condition assessment
using vibration response considering bridge-vehicle interaction

Zhi Sun, Zhongqiang Qi*

(publication_conf/acem12/T5D-6.pdf)

Photoelastic analysis of discontinuous infilled frame at loss of soil support

*Eman Elshamy**

(publication_conf/acem12/T5D-7.pdf)

Damage identification of bridges using traffic-induced vibration data

Hiromasa Doi, Mitsuo Kawatani, Chul-Woo Kim, Tatsuaki Toshinami*

(publication_conf/acem12/T5D-8.pdf)

Oscillator experiment of simple girder gridge coupled with vehicle

Ayumi Yamamoto, Mitsuo Kawatani, Chul-Woo Kim*

(publication_conf/acem12/T5D-9.pdf)

SESSION T5E-I

Bio- and Environmental Geomechanics and Engineering (Ilhan Chang)

Evaluation of cementation effect of sand mediated
by enzyme-induced calcium carbonate precipitation

Hideaki Yasuhara, Debendra Neupane*

(publication_conf/acem12/T5E-I-1.pdf)

An alternative method for soil treatment
sing environmentally-friendly biopolymers

Ilhan Chang, Awlia Kharis Prasadhi, Gun-Wook Joo, Gye-Chun Cho*

(publication_conf/acem12/T5E-I-2.pdf)

Uku thermal performance characteristics

TeKipa Kepa Brian Morgan, Jing Siong Cheah, Paul Jarvie, Jason Kururangi*

(publication_conf/acem12/T5E-I-3.pdf)

Development of eco-friendly soil binder using plant extracts

Sung-Sik Park, Sun-Gyu Choi, In-Hyun Nam*

(publication_conf/acem12/T5E-I-4.pdf)

SESSION T5E-II

Nanomaterials for Photovoltaic Applications (Saira Riaz & Shahzad Naseem)

Synthesis and characterization of CdS ink comprised of nanoparticles

Saira Riaz, Maleeha Qasim, Zain Akram, Shahzad Naseem*

(publication_conf/acem12/T5E-II-1.pdf)

Synthesis and Characterization of CdTe Ink Comprised of Nanoparticles

Saira Riaz, Zain Akram, Maleeha Qasim, Shahzad Naseem*

(publication_conf/acem12/T5E-II-2.pdf)

Synthesis and Characterization of Zn-doped and
un-doped SnO₂ nanostructures for PV applications

Saira Riaz, Gul Jabeen, Shahzad Naseem*

(publication_conf/acem12/T5E-II-3.pdf)

A comparative study of ZnO thin films, nanowires and nanotubes for photovoltaics applications

Saira Riaz, Rabia Noor, Shahzad Naseem*

(publication_conf/acem12/T5E-II-4.pdf)

ZnO / c-Si solar cell fabricated through sol-gel and spin coating

Saira Riaz, Sajid Farooq, Syed Sajjad Hussain, Shahzad Naseem*

(publication_conf/acem12/T5E-II-5.pdf)

ZnS dendrites - optical, electrical and structural properties

Saira Riaz, Sehrish Gull, Muhammad Saeed Akhtar, Shahzad Naseem*

(publication_conf/acem12/T5E-II-6.pdf)

ZnxCd_{1-x}S (x=0-1) thin films prepared by nano colloidal suspension - optical and structural analyses

Saira Riaz, Samia Hussain, Shahzad Naseem*

(publication_conf/acem12/T5E-II-7.pdf)

SESSION T5F

Advanced Water / Waste Water Treatment II

Microwave-assisted fabrication of novel photocatalysts for environmental remediation

Dieqing Zhang, Meicheng Wen, Shanshan Zhang, Guisheng Li, Hexing Li*

(publication_conf/acem12/T5F-1.pdf)

Study on fractional recovery of phosphorus from incinerated ash and anaerobically digested sludge

*Masanobu Takashima**

(publication_conf/acem12/T5F-2.pdf)

Comparison of sediment prediction based on neural network and Bagnold formula (a case study; Bazoft River)

Karim Solaimani, Nazila Sedaei*

(publication_conf/acem12/T5F-3.pdf)

Development and application of filtering system for NO₂ removal in a subway station

Jo-Chun Kim, Ho-Joon Choi, Jin-Ho Jeong, Youn-Suk Son, Jun-Seok Hong*

(publication_conf/acem12/T5F-4.pdf)

Alternative filtration for management of indoor air quality
in a Seoul metro-subway

Young Min Jo, Woo Ram Kim, Hae Woo Park*

(publication_conf/acem12/T5F-5.pdf)

Improvement of methylene blue removal using mixed solid waste activated carbon

Zeid ALOthman, Mohamed Habila, Rahmat Ali*

(publication_conf/acem12/T5F-6.pdf)

SESSION W3A

Wind Loads on Structural Systems & Field Measurements

Flow measurements using a simple fiber optic technique

Jia Liang Ang, Idapalapati Sridhar, Anand Krishna Asundi*

(publication_conf/acem12/W3A-1.pdf)

Unified non-stationary mathematical model for near-ground surface strong winds

Jun Chen, Jun Ma, Min Wu*

(publication_conf/acem12/W3A-2.pdf)

Wind tunnel tests of solar water heaters: Cross wind induced loads

Chin Cheng Chou, Keh Chin Chang, Kung Ming Chung*

(publication_conf/acem12/W3A-3.pdf)

A simple method to estimate wind loads on ships

Michio Ueno, Fumitoshi Kitamura, Toshifumi Fujiwara, Naoto Sogihara*

(publication_conf/acem12/W3A-4.pdf)

Internal wind pressures for the design of pipe-framed greenhouses

Kim Namseok, Uematsu Yasushi*

(publication_conf/acem12/W3A-5.pdf)

Wind loads on two or three open-topped oil-storage tanks in various arrangements

Jumpei Yasunaga, Choongmo Koo, Yasushi Uematsu, Koji Kondo, Manabu Yamamoto*

(publication_conf/acem12/W3A-6.pdf)

Wind loads for permeable cladding elements with high porosity

Frank Kemper and Markus Feldmann*

(publication_conf/acem12/W3A-7.pdf)

SESSION W3B

Polymeric Materials

New optical material emit blue light poly (vinyl alcohol) films filled with Lanthanum-N-Ethylmorpholine complex

*Kamal Abd El-Qader Ahmed**

(publication_conf/acem12/W3B-1.pdf)

A study of plastic plateau disappearance in stress-strain curve of annealed polypropylene films during stretching

Caihong Lei, Shuqiu Wu, Ruijie Xu, YUnqi Xu, Xinlong Peng*

(publication_conf/acem12/W3B-2.pdf)

Effect on capacitance of porous structure in cellular polymer

*Sung Woon Cha, Young Ho Kim**

(publication_conf/acem12/W3B-3.pdf)

Miscibility and thermal properties of PLLA-based blends

Fang-Chyou Chiu, Chen-Tsyrr Lo*

(publication_conf/acem12/W3B-4.pdf)

Enhanced thermal conductivity of polyimide films via a hybrid of micro- and nano-sized boron nitride

Steve Lien-chung Hsu, Tung-Lin Li*

(publication_conf/acem12/W3B-5.pdf)

Synthesis of a new porous anionic metal-organic framework constructed of terephthalic acid

Ali Morsali, Sarah Karbalaee Khani*

(publication_conf/acem12/W3B-6.pdf)

Crystal to crystal transformation of Nano Lead(II) coordination polymer by solid state anion-replacement

Ali Morsali, Vahid Safarifard*

(publication_conf/acem12/W3B-7.pdf)

SESSION W3C

Direct Geothermal Energy: a Geotechnical Perspective

(Guillermo A Narsilio & Ian Johnston)

Energy pile performance and preventing ground freezing

Fleur Loveridge, Tony Amis, William Powrie*

(publication_conf/acem12/W3C-1.pdf)

Direct geothermal energy research and demonstration projects for Victoria, Australia

Guillermo Narsilio, Ian Johnston, Stuart Colls, Asal Bidarmaghz,
Amir Valizadeh Kivi, Soudabeh Neshastehriz*

(publication_conf/acem12/W3C-2.pdf)

Numerical modelling of GHE configurations and geometry
for direct geothermal applications

Asal Bidarmaghz, Guillermo A. Narsilio, Ian W. Johnston*

(publication_conf/acem12/W3C-3.pdf)

Numerical simulation of seasonal performance of energy pile

Seung-Rae Lee, Hyunku Park, Seok Yoon, Dowon Park*

(publication_conf/acem12/W3C-4.pdf)

Evaluation of effective ground thermal conductivity
for standing column well (SCW): Numerical modeling for in-situ TRT

Hangseok Choi, Chulho Lee, Jeehee Lim, Myungsup Yoon*

(publication_conf/acem12/W3C-5.pdf)

Engineered soils: Thermal conductivity

Douglas D. Cortes, J. Carlos Santamarina*

(publication_conf/acem12/W3C-6.pdf)

Study on heat exchange characteristics for PHC energy piles

Hangseok Choi, Sangwoo Park, Chulho Lee, Yong-Boo Park, Jeong-Rak Sohn*

(publication_conf/acem12/W3C-7.pdf)

An equivalent diameter in calculating borehole thermal resistance
for spiral coil type GHE

SKhan Park, Seung-Rae Lee, Hyun Ku Park, Seok Yoon,
Gyu-Hyun Go, Han Byul Kang, Jaywan Chung*

(publication_conf/acem12/W3C-8.pdf)

SESSION W3D

Bridge Aero Dynamics (Jongdae Kim)

Time domain buffeting analysis of the Messina Strait Bridge - benchmark study

Saang Bum Kim, Akihide Hatanaka, Hiroshi Tanaka, Hyun Yang Shin*

(publication_conf/acem12/W3D-1.pdf)

Flutter stability analysis of long span bridge subjected to wind load by non-white noise process

Akihide Hatanaka, Hiroshi Tanaka, Saang-Bum Kim, Shigeyuki Matsuho*

(publication_conf/acem12/W3D-2.pdf)

Flutter and gust response analysis of the Messina Strait Bridge - benchmark study

Hiroshi Tanaka, Akihide Hatanaka, Saang-Bum Kim, Jong-Ho Yang*

(publication_conf/acem12/W3D-3.pdf)

Numerical investigation of aerodynamic interference on wind loads for a twin bridge

*Jong-Dae Kim**

(publication_conf/acem12/W3D-4.pdf)

Numerical study of aerodynamic flutter derivatives for a plate girder bridge deck

*Jong-Dae Kim**

(publication_conf/acem12/W3D-5.pdf)

SESSION W3E

Membranes for Water Treatment / Surface Characteristics / Transport Phenomena

Novel thin film composite membranes containing ionizable hydrophobes for efficient water desalination

Young-Hye Na, Jacquana Diep, Radwan Al-Rasheed, Geoff Geise, Benny Freeman, Ankit Vora, Majed Nassar, Geraud Dubois, Ratnam Sooriyakumaran, Robert Allen*

Electrokinetic characterization of composite membranes from streaming current measurements

Anthony Szymczyk, Yonis Ibrahim Dirir*

(publication_conf/acem12/W3E-2.pdf)

Ion selectivity of inhomogeneously charged NF membranes

Anthony Szymczyk, Yonis Ibrahim Dirir, Takoua Foudhaili, Lydie Paugam*

(publication_conf/acem12/W3E-3.pdf)

Investigation of dehydration and pore swelling effects
on the transfer of PEG through NF membranes

Patrick Fievet, Aurelie Escoda, Saliha Bouranene, Sebastien Deon, Anthony Szymczyk*

(publication_conf/acem12/W3E-4.pdf)

SESSION W3F

Low Impact Development & Water Cycle Restoration (Kyoung-hak Hyun, Jong-suk Jung & Jung-min Lee)

Indigenous knowledge contribution to watershed management

TeKipa Kepa Brian Morgan, Brian C. Peacock, Emily Voyde, Daniel Hikuroa, Robyn Desma Manuel*

(publication_conf/acem12/W3F-3.pdf)

Effects of decentralized rainwater management
on the energy balance in the city

*Young-Hae Han, Tae-Goo Lee**

(publication_conf/acem12/W3F-6.pdf)

SESSION W4A

Wind Tunnel Modeling & Test

A new simulator to recreate extreme dynamic wind loads on
large-scale building components and cladding systems

Forrest Masters, Seraphy Shen, Henry Upjohn II*

(publication_conf/acem12/W4A-1.pdf)

Wind tunnel measurement of turbulent boundary layer
over hypothetical urban roughness

Yat-Kiu Ho, Chun-Ho Liu*

(publication_conf/acem12/W4A-2.pdf)

Effect of the wake of the transducer supports
on the ultrasonic anemometer measurements

Sebastian Franchini, Alvaro Cuerva, Angel Sanz-Andres*

(publication_conf/acem12/W4A-3.pdf)

Aeroelastic model test for a tall building using tuned liquid column damper

Jang Youl You, Ki-Pyo You, Young-Moon Kim*

(publication_conf/acem12/W4A-4.pdf)

SESSION W4B

Iron Oxide - A Promising Material for Spintronic / Medical Applications (Saira Riaz & Shahzad Naseem)

Preparation and characterization of BiFeO₃ thin films by sol-gel route

Saira Riaz, Aseya Akbar, Shahzad Naseem*

(publication_conf/acem12/W4B-1.pdf)

Synthesis and characterization of FeO-ZrO₂ nanoparticles for bio-medical applications

Saira Riaz, Saher Hamid, Shahzad Naseem*

(publication_conf/acem12/W4B-2.pdf)

Fabrication and magnetic characterization of AAO template assisted growth of Fe₃O₄ nanotubes

Saira Riaz, Aseya Akbar, Shahzad Naseem*

(publication_conf/acem12/W4B-3.pdf)

Thermally evaporated Fe-Ox thin films for use in MTJs – structural, magnetic and electrical properties

Saira Riaz, Sidra Farooq, Shahzad Naseem*

(publication_conf/acem12/W4B-6.pdf)

Structural, electrical and magnetic investigations of Pb-doped La_{0.1}Bi_{0.90}FeO₃ multiferroics

Imran Ghafoor, Saadat A. Siddiqi, Shahid Atiq, Saira Riaz, Shahzad Naseem*

(publication_conf/acem12/W4B-8.pdf)

Effect of Cu content on the structural, electrical and magnetic properties of Mn-Ferrites

*Shahid Atiq, Zaib-un- Nisa, Saadat Siddiqi, Saira Riaz, Shahzad Naseem**

(publication_conf/acem12/W4B-9.pdf)

Induced modifications in the structural, electrical and magnetic properties of Sr-doped BiFeO₃ multiferroics

Shahid Atiq, Tanvir Hussain, Saadat Siddiqi, Saira Riaz, Shahzad Naseem*

(publication_conf/acem12/W4B-10.pdf)

Characterization of polycrystalline Zinc Ferrite (ZnFe_2O_4)
by XRD, SEM, IS and resistivity measurements

*Shahid Atiq, Uzma Ghaznavi, Saadat Sidiqi, Shahzad Naseem**

(publication_conf/acem12/W4B-11.pdf)

SESSION W4C

Ground Improvement

Probabilistic Study into the Impact of Soil Spatial Variability
on Soil Consolidation by Prefabricated Vertical Drains

Md. Wasiul Bari, Mohamed A. Shahin, Hamid R. Nikraz*

(publication_conf/acem12/W4C-1.pdf)

Calcium carbonate induced precipitation
for soil improvement by urea hydrolysing bacteria

Mohamed Shahin, Atticus Dekuyer, Liang Cheng, Ralf Cord-Ruwisch*

(publication_conf/acem12/W4C-2.pdf)

Application of endochronic densification law
for designing vibroflotation soil improvement technique

Jaime Peco, Susana Lopez-Querol*

(publication_conf/acem12/W4C-3.pdf)

Ground improvement on clay with interbedded sand
using electroosmotic chemical treatment

Shao-Chi Chien, Pio-Go Hsieh, Chang-Yu Ou*

(publication_conf/acem12/W4C-4.pdf)

Ground improvement optimization with Prefabricated Vertical Drains (PVD)
and surcharge preloading

Jose Leo Mission, Hyeong-Joo Kim, Myoung-Soo Won*

(publication_conf/acem12/W4C-5.pdf)

Ground improvement of Mekong Delta soft clay by
preloading with PVD and vacuum at a site in Southern Vietnam

Quang Duy Nguyen, Giao Huy Pham*

(publication_conf/acem12/W4C-6.pdf)

SESSION W4D

Dynamic Analysis of Structures under Blast/Impact Loading

(Hyung-Jo Jung)

Numerical analysis of multiple blast effect on steel pipe

Kyeng Cheol Kim, Hyung Jo Jung, Young Cheol Huh*

(publication_conf/acem12/W4D-1.pdf)

Alternative approach of pressure-impulse diagram for multi-peak pressure

Jong Yil Park, Theodor Krauthammer*

(publication_conf/acem12/W4D-2.pdf)

Challenges in protective structures R&D

*Theodor Krauthammer, Jong Yil Park**

(publication_conf/acem12/W4D-3.pdf)

Numerical simulations on the dynamic response of
a full-scaled steel frame structure

subject to a surface burst explosion using LS-DYNA

Young-Cheol Huh, Tae-Young Chung, Kyeng-Cheol Kim,
Hyung-Jo Jung, Hyun-Hoon Choi*

(publication_conf/acem12/W4D-4.pdf)

Coupling ratio verification of
direct displacement based design procedure for RC coupled walls

F. Gulden Gulay, A. Emre Toprak, I. Engin Bal*

(publication_conf/acem12/W4D-5.pdf)

SESSION W4E

Wind Effects on Tall Buildings (Aly Mousaad Aly & Emil Simiu)

Evaluation of wind-induced dynamics of high-rise buildings
by means of modal approach

Lorenzo Rosa, Gisella Tomasini, Alberto Zasso, Aly Mousaad Aly*

(publication_conf/acem12/W4E-1.pdf)

Aeroelastic effects on a high-rise rectangular section building

*Stefano Giappino, Gisella Tomasini, Alberto Zasso, Lorenzo Rosa**

(publication_conf/acem12/W4E-2.pdf)

Application of Ecological and waste materials on
produced Green-Art brick

Chuan-Chi Chien, Liang-Rung Chang, Yueh-Shih Lu, Tsung-Yin Yang*

(publication_conf/acem12/W4E-4.pdf)

Assessment of wind-induced structural fatigue based on
joint probability density function of wind speed and direction

Jun Chen, Taotao Lin, Xiang Li, Xiaoqin Zhang*

(publication_conf/acem12/W4E-5.pdf)

SESSION W4F

Advanced Water / Treatment / Hazardous Substance Management / Green and Sustainable Environmental Management

Effect of natural aquatic colloids on the adsorption of
three selected endocrine disrupting chemicals by sediments

*Weiling Sun, Kun Zhou**

(publication_conf/acem12/W4F-1.pdf)

Ordering disconnected watershed digital stream networks
with developing a object oriented model in GIS environment

Karim Solaimani, Mohamoodreza Tabatabaei*

(publication_conf/acem12/W4F-2.pdf)

Experimental Investigation on mechanical properties of
WGP-metakaolin cement mortars

Mohsen Hasanzadeh, Iman Janghorban Esfahani, Shahab Rabbani, Emad Janghorban*

(publication_conf/acem12/W4F-3.pdf)

Life cycle assessment of sewer system: Comparison of pipe materials

Dongwook Kim, Sora Yi, Woojin Lee*

(publication_conf/acem12/W4F-4.pdf)

Defluoridation of drinking water from public water supply system
using natural materials and nano hydroxy apatites

Ramanathan AL, Chidhambaram S., Kalkura Narayan*

(publication_conf/acem12/W4F-5.pdf)

Photocatalytic properties of P25 nanoparticles

impregnated ZnO flowers prepared via hydrothermal process

Hem Raj Pant, Cheol Sang Kim*

(publication_conf/acem12/W4F-6.pdf)

An Investigation of urban green roof development
in developing countries (A case study of Iran)

*Sedigheh Lotfi**

(publication_conf/acem12/W4F-7.pdf)

Appraisal of certain anaerobic digestion studies

*Ram Pal Singh**

(publication_conf/acem12/W4F-8.pdf)

SESSION W5A

Computational Wind Engineering (CWE)

Uniform flow around a square cylinder
using the self-induced angular momentum method turbulence model

Jens Johansson, M.P. Nielsen, Leif O. Nielsen*

(publication_conf/acem12/W5A-1.pdf)

Hybrid RANS/LES method for FSI simulations of tall buildings

Rooh Ul Amin Khurram, Yue Zhang, Amir Borna, Wagdi G Habashi*

(publication_conf/acem12/W5A-2.pdf)

Large-eddy simulation of flows over idealized urban roughness
in unstable thermal stratification

Ming-Chung Chan, Chun-Ho Liu*

(publication_conf/acem12/W5A-3.pdf)

Numerical simulation on fluid-structure interaction of
wind around super-tall building at high Reynolds number conditions

Shenghong Huang, Rong Li, Q.S. Li*

(publication_conf/acem12/W5A-4.pdf)

Actuator disc modeling based on aerodynamic data extraction
from direct rotor modeling of the NREL Phase VI turbine

Abdulqadir Aziz Singapore Wala, Eddie Yin-Kwee Ng*

(publication_conf/acem12/W5A-5.pdf)

Performance analysis of horizontal axis tidal stream turbine

considering the effect of blade deformation

Shin Hyung Rhee, Se Wan Park, Sunho Park*

(publication_conf/acem12/W5A-6.pdf)

LES analysis of a wind turbine wake using an actuator disk model

Takaaki Kono, Tetsuya Kogaki*

(publication_conf/acem12/W5A-7.pdf)

Wind energy potential for small-scale wind concentrator turbines

Ashraf Amer, Ahmed Hamza H. Ali, Yehia ElMahgary, Shinichi Ookawara, Mahmoud Bady*

(publication_conf/acem12/W5A-8.pdf)

SESSION W5B-I

Geometry-Property Relation in Solids (Hiroyuki Shima & Motohiro Sato)

Wavy-shaped cross-sectional deformation in multiwalled cylinders with inner stiffener

Motohiro Sato, Tetsuro Ikeda, Yuta Ishiwata, Sung-Jin Park, Hiroyuki Shima*

(publication_conf/acem12/W5B-I-1.pdf)

Symmetry-breaking deformation mode in
radially-pressurized complete spherical shells

Motohiro Sato, Takafumi Sekizawa, Yoshiteru Konishi*

(publication_conf/acem12/W5B-I-2.pdf)

Three-dimensional free vibration analysis of
functionally graded rectangular plates using the B-spline Ritz method

Harunobu Nagino, Motohiro Sato, Tomisaku Mizusawa, Takashi Mikami*

(publication_conf/acem12/W5B-I-3.pdf)

Three-dimensional bending analysis of rectangular thick plates
on elastic foundations using the B-spline Ritz method

Harunobu Nagino, Mayuko Okawa, Masahiro Higuchi,*

Tadaharu Adachi, Tomisaku Mizusawa, Takashi Mikami

(publication_conf/acem12/W5B-I-4.pdf)

SESSION W5B-II

Wind Engineering / Geomechanical

Wind effect on spread of fire and smoke

W.K. Chow, N. Cai*

(publication_conf/acem12/W5B-II-1.pdf)

Wind effect on smoke exhaust by natural vent

W.K. Chow, J. Li*

(publication_conf/acem12/W5B-II-2.pdf)

Loading unsaturated soil

*Mohamed Abdellatif Albarqawy**

(publication_conf/acem12/W5B-II-3.pdf)

Investigation on probability density function for cone penetration test data

Maryam Sadat Seyedein, Reza Jamshidi Chenari, Abolfazl Eslami*

(publication_conf/acem12/W5B-II-4.pdf)

Wetting behaviour of an unsaturated compacted clayey silty sand
under anisotropic stress states

Qafar Karami, Mohammad Maleki, Masood Makarchian, Majid shahi Karijani*

(publication_conf/acem12/W5B-II-5.pdf)

SESSION W5C

Geotechnical Issues II

Correlation between Inelastic volumetric strain and acoustic emission wave
for damage assessment

Jin-Seop Kim, Kyung-Soo Lee, Heui-Joo Choi, Gye-Chun Cho*

(publication_conf/acem12/W5C-1.pdf)

Geotechnical considerations for offshore wind turbines based on neural network

Mert Tolon, Derin N. Ural*

(publication_conf/acem12/W5C-2.pdf)

Three-dimensional finite element modelling of monopiles for offshore wind turbines

Aliasger Haiderali, Gopal Madabhushi*

(publication_conf/acem12/W5C-3.pdf)

Stability analysis for a reinforced earth retaining wall
with vertical steel poles and front metal meshes

Yeong-Saeng Lee, Jun-Yeong Yoon*

(publication_conf/acem12/W5C-4.pdf)

Evaluation the effectiveness of remedial works applied to Li-shan landslide

Miau-Bin Su, Shei-Chen Ho, Chi-Cheng Chen*

(publication_conf/acem12/W5C-5.pdf)

Vibration reduced rock excavation using waterjet technology

Tae-Min Oh, Gun-Wook Joo, Gye-Chun Cho, In-Taeg Ji, Seok-Yeol Jeong*

(publication_conf/acem12/W5C-6.pdf)

SESSION W5D

Wind-Structure Interactions

Flutter dynamics of a bi-plane: a mathematical model

Stefanie Gutschmidt, Jason McVicar, Caroline DeLong*

(publication_conf/acem12/W5D-1.pdf)

On the influence of wind-conductor interactions in
stress analysis of overhead transmission line towers

Hooman Keyhan, Ghyslaine McClure, Wagdi G. Habashi*

(publication_conf/acem12/W5D-2.pdf)

Aerodynamic behaviour of hyperbolic paraboloid roofs:
Comparison between PIV tests and CFD simulations

Fabio Rizzo, Piero D'Asdia, Federica Speziale*

(publication_conf/acem12/W5D-3.pdf)

Modelling of vortex induced vibration for two degrees of freedom

Manish Dhanwani, Abhijit Sarkar, B.S.V Patnaik*

(publication_conf/acem12/W5D-4.pdf)

FEM analysis of tension structures with experimental wind action

Fabio Rizzo, Piero D'Asdia, Federica Speziale*

(publication_conf/acem12/W5D-5.pdf)

Estimation of wind loading on trees for a vegetated building envelope:
a multi-scale experimental study

Aly Mousaad Aly, Alberto Zasso, Alberto Franchi, Pietro Crespi,*

Nicola Longarini, Arindam Gan Chowdhury, Girma Bitsuamlak

(publication_conf/acem12/W5D-6.pdf)

Classification of three-dimensional turbulent and transitory flow regimes
for inclined circular cylinders

Elena Dragomirescu, Michael Shane Hoftyzer*

(publication_conf/acem12/W5D-7.pdf)

SESSION W5E Materials

Synthesis and characterization of $(\text{Bi}_2\text{O}_3)_{1-x-y}(\text{Co}_2\text{O}_3)_x(\text{M}_2\text{O}_3)_y$ [$\text{M}=\text{Dy}, \text{Ho}, \text{Er}$], nano solid solution via sol-gel method

Abdolali Alemi, Zolfegar Rezvani, Marziye Hosseini*

(publication_conf/acem12/W5E-1.pdf)

Preparation and study of nano niobium pentoxide doped and co-doped with Gd^{3+} , Mn^{3+} via solid state method

Abdolali Alemi, Mohmmadreza Hamedpour*

(publication_conf/acem12/W5E-2.pdf)

Study the property of high strength polypropylene fiber concrete

Hsiu-Lung Huang, Chao-Lung Hwang, Sheng-Szu Peng,*

Chun-Tsun Chen, Hui-Chuan Lee

(publication_conf/acem12/W5E-4.pdf)

Opto-thermal properties of basalt fibres using digital holographic interferometry

*Khaled Mohamed Yassien**

(publication_conf/acem12/W5E-5.pdf)

Effect of praseodymium dopants on the optical properties of Polyvinyl alcohol (PVA) films

Kamal Abd El-Kader Marei, Fayez Mohamed Ali, Ahmed Mohamed El-Mahalawy*

(publication_conf/acem12/W5E-6.pdf)

SESSION W5F Advances Soil and Groundwater in conjunction with KAIST/DTU Integrated SMART Groundwater Treatment Technology

Oxidative degradation of pyrene wastewater with cetylpyridinium chloride in pyrite suspension

Kyunghoon Choi, Woojin Lee*

(publication_conf/acem12/W5F-1.pdf)

Source zone remediation by ZVI-clay soil mixing:
Reduction of tetrachloroethene mass and mass discharge at a Danish DNAPL site

Annika Sidelmann Fjordboge, Philip J. Binning, Poul L. Bjerg,
Charlotte Riis, Anders G. Christensen, Mads Terkelsen, Peter Kjeldsen*

(publication_conf/acem12/W5F-2.pdf)

Covalent Organic Polymers (COPs) for selective metal adsorption from wastewaters

*Cafer T. Yavuz**

(publication_conf/acem12/W5F-3.pdf)

Life cycle assessment combined with remedial performance modeling
for assessment of the environmental impacts of remediation technologies

Poul L. Bjerg, Gitte Lemming, Julie Chambon, Philip J. Binning*

(publication_conf/acem12/W5F-6.pdf)

Application of laser-induced breakdown spectroscopy
for the determination of Cd and Pb in water:

Influence of ambient gas on the detection sensitivity

Dong-Hyoung Lee, Tae-Hyeong Kim and Jong-Il Yun*

(publication_conf/acem12/W5F-7.pdf)

Feasibility and performance of full-scale in-situ remediation
of TCE by ERD in clay tills

Mette M. Broholm, Ida Damgaard, Julie Chambon, Gabriele Manoli,
Dorte M. Pade, Camilla Christiansen, Phillip J. Binning, Claus Westergaard,
Aikaterini Tsitonaki, Mette Christophersen, Henriette, Kern-Jespersen, Poul L. Bjerg*

(publication_conf/acem12/W5F-8.pdf)

Enhanced degradation of RDX
by *Shewanella putrefaciens* CN32 and iron bearing soil minerals

*Changhyun Cho**

(publication_conf/acem12/W5F-9.pdf)

SESSION M4B

Core Technologies for Offshore Windturbines II (Warn-Gyu Park & Jin-Rae Cho)

Orifice shape effect of the TLCD system under a low frequency wave

*Yuan Zhang, Zhen-Zhong Yuan, Hee-Chang Lim**

(publication_conf/acem12/M4B-1.pdf)

Basic design and finite element analysis of substructure of
2.5MW floating-type offshore wind turbine

Dae-Yeon Lee, Kyung-Tae Kim, Cheon-Soo Cho, Jin-Rae Cho, O-Kaung Lim*

(publication_conf/acem12/M4B-2.pdf)

Optimal design of floating platform and substructure
for a spar type wind turbine system

E.J. Choi, B. Wang, S. Jung, C. Han, S. Park*

(publication_conf/acem12/M4B-3.pdf)

Numerical parametric study on liquid sloshing in a rectangular tank

*Minho Ha, Daehwan Kim, Cheolung Cheong**

(publication_conf/acem12/M4B-4.pdf)

Numerical and experimental investigations into liquid sloshing
in a rectangular tank

Minho Ha, Daehwan Kim, Hu In Choi, Cheolung Cheong, Sun Hong Kwon*

(publication_conf/acem12/M4B-5.pdf)

A study on the characteristics of annular cylindrical sloshing damper
for floating-type offshore wind turbine

*Myeong-Woo Seo, Yang-Uk Cho, Jin-Rae Cho, Weui-Bong Jeong**

(publication_conf/acem12/M4B-6.pdf)

Hydrodynamic response of alternative floating substructures
for spar-type offshore wind turbines

B.W. Wang, E.J. Choi, S. Jung, S. Park*

(publication_conf/acem12/M4B-7.pdf)

TLCD Systems on Non-Rigid Pads

***Yoyong Arfiadi¹⁾ and Ade Lisantono²⁾**

^{1), 2)} *Department of Civil Engineering, Atma Jaya Yogyakarta University, Indonesia*
¹⁾ *yoyong@mail.uajy.ac.id*

ABSTRACT

Reducing response of structures due to earthquake is the main concern of structural engineers. Many methods have been proposed to control the vibration of buildings; these include passive and active control systems. In practice, passive control systems are more popular than active control ones, and have been used in many buildings, due to their simplicity. Among passive control systems are tuned liquid column dampers (TLCDs). TLCDs rely on the motion of a liquid mass in tube-like containers to counteract the external force. By adjusting the sizes and properties of the liquid, the response reduction can be achieved. Most of TLCDs rest on fixed supports where the column dampers move related to the movement of floor. It is possible that TLCD systems are placed on a flexible support. This paper investigates the effectiveness of TLCD systems rest on rigid pads. When the TLCD rests on a flexible support (pad), the response reduction can also be achieved if the properties of the pad and TLCD are adjusted. The properties of the TLCDs and the properties of the pads are optimized by using real coded genetic algorithms (GAs) with the performance index is taken as H_2 norm of the transfer function from external disturbances to the regulated outputs. Numerical examples are the carried out to see the effectiveness of TLCD systems rest on flexible pads in reducing structural response subject to earthquake.

Keywords: liquid dampers, response reduction, vibration control, optimization, real coded genetic algorithms, H_2 norms

1. INTRODUCTION

The use of control systems in flexible buildings has been attempted in order to reduce the response of structures under excessive vibrations. These include passive and active control systems including their combinations. Passive control systems are interesting due to their simplicity. Several passive control systems that have been applied in real buildings are tuned mass dampers (TMDs) and tuned liquid column dampers (TLCDs). TLCDs are basically similar to TMDs where the ability to reduce the response is provided by the oscillations of liquid in a U tube. Some advantages of using TLCDs for vibration suppressions are: the liquid is easy mobilized; the TLCDs properties can be easily tuned when there are changes in the dynamic characteristics

¹⁾ Professor

²⁾ Associate Professor

of the main systems; low manufacturing, installation, and maintenance costs; and the water in the U-tube can be used as a secondary water source in case of emergency (Hithcock et al. 1997; Kim and Adeli 2005). The first suggestion to use TLCDs for reducing the structural response is proposed by Sakai et al (1989). Sadek et al. (1998) proposed optimization of TLCDs by using linearization of velocity of the liquid utilizing Taylor series. Chen and Chao (2000) utilized Den-Hartog's method to obtain the optimal damping ratio of TLCDs systems by neglecting the damping ratio of the main systems. Wu and Chang (2006) carried out the optimization TLCDs by using frequency domain approach under a white noise disturbance. Design tables for designing TLCDs were provided for practical applications. Chang et al. (2010) utilized computational fluid dynamic model to predict the properties of TLCDs systems. To increase the capability of TLCDs in reducing vibration, Yalla et al. (2001) proposed to use semi active TLCDs. The experimental study of semi active TLCDs was conducted by Yalla and Kareem (2003).

It is to be noted that in most of the research, the TLCDs are rigidly connected to the main structures. There is a situation that the TLCDs are placed on the flexible pads on the buildings. Arfiadi (2007) conducted a preliminary study on the TLCDs rest on the flexible pads. The optimization of TLCDs properties was carried out by directly minimizing the maximum time domain response under a particular earthquake excitation. However, the computer time to obtain the optimum properties might not be accepted at the current condition.

2. EQUATIONS OF MOTION

A TLCDs system rest on flexible support is considered as shown in Fig. 1. Equations of motion can be written following Chen and Chao (2000) as follows:

$$[M_s]\{\ddot{U}_s\} + [C_s]\{\dot{U}_s\} + [K_s]\{U_s\} = \{e_s\}\ddot{u}_g \quad (1)$$

where

$$[M_s] = \begin{bmatrix} m_s & 0 & 0 \\ 0 & m_b + m_d & \alpha m_d \\ 0 & \alpha m_d & m_d \end{bmatrix}, [C_s] = \begin{bmatrix} c_s + c_b & -c_b & 0 \\ -c_b & c_b & 0 \\ 0 & 0 & c_d \end{bmatrix}, [K_s] = \begin{bmatrix} k_s + k_b & -k_b & 0 \\ -k_b & k_b & 0 \\ 0 & 0 & k_d \end{bmatrix},$$

$$\{e_s\} = -\begin{Bmatrix} m_s \\ m_b + m_d \\ \alpha m_d \end{Bmatrix}, \{U_s\} = \begin{Bmatrix} u_s \\ u_b \\ u_d \end{Bmatrix} \quad (2)$$

and m_s = mass of the structure, m_b = mass of the TLCD's support, $m_d = \rho A_y L$ = mass of the liquid, where ρ = liquid density, A_y = cross sectional area of the tube, $L = 2H + B$, H = vertical length of the liquid, B = horizontal length of the liquid, c_s = damping factor of structure, c_b = damping factor of the TLCD's support,

$$c_d = 0.5\rho A_y C_d |\dot{u}_d| \quad (3)$$

C_d = head loss coefficient, k_s = stiffness of the structure, k_b = stiffness of the TLCD support,

$$k_d = 2\rho A_y g \quad (4)$$

is the stiffness of the TLCD, g = gravitational constant,

$$\alpha = B/L \quad (5)$$

is the length ratio, u_s = displacement of the structure, u_b = displacement of the TLCD's support, u_d = displacement of the liquid and u_g = ground displacement. The dot represents derivative with respect to time.

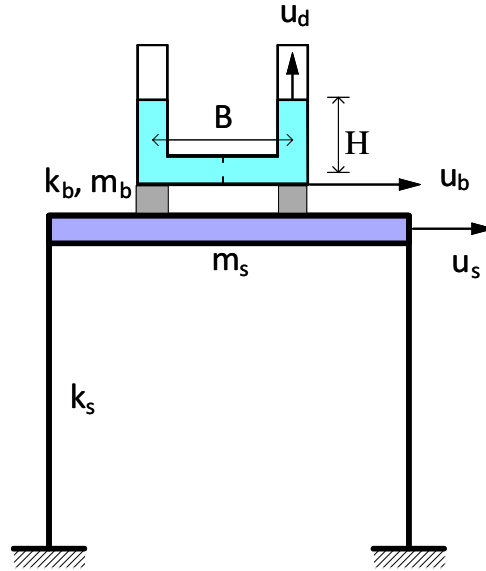


Fig. 1. TLCDs on flexible support

Eq. (1) can be converted into state space equations:

$$\{\dot{\mathbf{Z}}\} = [\mathbf{A}]\{\mathbf{Z}\} + \{\mathbf{E}\}w \quad (6)$$

where

$$\{\mathbf{Z}\} = \left\{ \begin{Bmatrix} u_s \\ \dot{u}_s \end{Bmatrix} \right\}, [\mathbf{A}] = \begin{bmatrix} [0] & [I] \\ -[\mathbf{M}_s]^{-1}[\mathbf{K}_s] & -[\mathbf{M}_s]^{-1}[\mathbf{C}_s] \end{bmatrix}, \{\mathbf{E}\} = \left\{ \begin{Bmatrix} 0 \\ [\mathbf{M}_s]^{-1}\{\mathbf{e}_s\} \end{Bmatrix} \right\}, \text{ and } w = \ddot{u}_g \quad (7a-d)$$

3. OBJECTIVE FUNCTION

As the objective function is taken as H_2 norm of the transfer function from external disturbance to the regulated output:

$$[T_{zw}] = [C_z](s[I] - [A])^{-1}\{E\} \quad (8)$$

where $[T_{zw}]$ = transfer function from disturbance w to the regulated output $\{z\}$, s = Laplace variable, and $[C_z]$ = matrix to relate the regulated output and state vector of the form

$$\{z\} = [C_z]\{Z\} \quad (9)$$

By choosing the appropriate value in matrix $[C_z]$ the designer has the flexibility to define the response to be minimized whether displacement or velocity. In the current problem, the displacement of the structure is taken as the regulated output.

The H_2 norm is calculated by (Doyle et al. 1989):

$$\|[T_{zw}]\|_2 = \left[\frac{1}{2\pi} \int_{-\infty}^{\infty} \text{tr} \left\{ [T_{zw}]^*(j\omega) [T_{zw}(j\omega)] \right\} d\omega \right]^{\frac{1}{2}} \quad (10)$$

where $\|[T_{zw}]\|_2 = H_2$ norm of transfer function from w to $\{z\}$, ω = excitation frequency, j = imaginary number, $(\cdot)^*$ = complex conjugate transpose of $(\cdot)$ and tr is trace of $(\cdot)$. In the state space form, the H_2 norm is computed using (Doyle et al. 1989):

$$\|[T_{zw}]\|_2 = \left[\text{tr} \left([C_z][L_c][C_z]^T \right) \right]^{\frac{1}{2}} \quad (11a)$$

$$\|[T_{zw}]\|_2 = \left[\text{tr} \left(\{E\}^T [L_o] \{E\} \right) \right]^{\frac{1}{2}} \quad (11b)$$

Where $[L_c]$ dan $[L_o]$ can be obtained from Lyapunov equation:

$$[A][L_c] + [L_c][A]^T + \{E\}\{E\}^T = \{0\} \quad (12a)$$

$$[A]^T [L_o] + [L_o][A] + [C_z]^T [C_z] = \{0\} \quad (12b)$$

4. OPTIMIZATION

To optimize the TLCDs properties and the flexible pad, genetic algorithms (GA) proposed by Holland (1992) were used. In GAs, the solution is considered as a population of candidates. These candidates (individuals) experience evolutionary process through selection, crossover and mutation. The individuals in the population

are selected by using a roulette wheel selection procedure. Each individual in the population has its own fitness according to the defined objective function. The candidates experience crossover and mutation to produce offspring. The selection, crossover and mutation are done generation per generation such that at the final generation, the most fit individual is taken as the optimum value of design variables.

In this paper real coded genetic algorithms (RC-GAs) was used. In RC-GAs, design variables were represented by using real numbers (Michalewics 1996, Herrera et al. 1998, Arfiadi and Hadi 2001). In the process, a simple mutation and balanced crossover (Herrera et al. 1998) were used in the algorithms. In addition an elitist strategy (Grefenstette 1986), such that the most fit individual is always passed on to the next generation, was used in the analysis. To increase the variability in the population, new individuals are always inserted in the new generation replacing a portion of old individuals. The flowchart of RC-GA used in this paper can be seen in Fig. 2.

5. NUMERICAL SIMULATION

Consider a single degree of freedom system with the following properties: $m_s = 20$ t, $c_s = 12.57$ kN-s/m, $k_s = 789.57$ kN/m², and $\alpha = 0.4$. Variable designs to be obtained are: A_y , k_d , m_b , k_b and c_b where the liquid density = 1 t/m³. RC-GAs are used to obtain the design variables, where the maximum generation = 500; probability of crossover = 0.8; probability of mutation = 0.2; the new inserted individuals to replace old individuals = 10% of the population. As the H_2 norm is used, C_d is taken equals to zero in the analysis. This can be considered as the lower bound of damping inclusion of TLCDs. Three cases are investigated, i.e., when the mass ratios $\mu = m_d/m_s$ are taken equal to 1%, 5 % and 10%. The results are shown in Table 1.

Table 1. Design variables for different mass ratio

Design variables	Mass ratio		
	$\mu = 1\%$	$\mu = 5\%$	$\mu = 10\%$
A_y (m)	0.073	0.351	0.696
k_d (kN/m)	1.423	6.886	13.657
m_b (t)	9.345	9.034	8.343
k_b (kN/m)	105.08	102.59	102.15
c_b (kN-s/m)	19.536	20.36	20.665
L (m)	2.758	2.85	2.873
B (m)	1.103	1.14	1.149

Note that for each mass ratio, at the initial generation, the design variables produce negative fitness, which shows that the optimum vales are difficult to obtain. However after several generations the simulation is stabilized. The best fitness for $\mu = 10\%$ is depicted in Fig. 3.

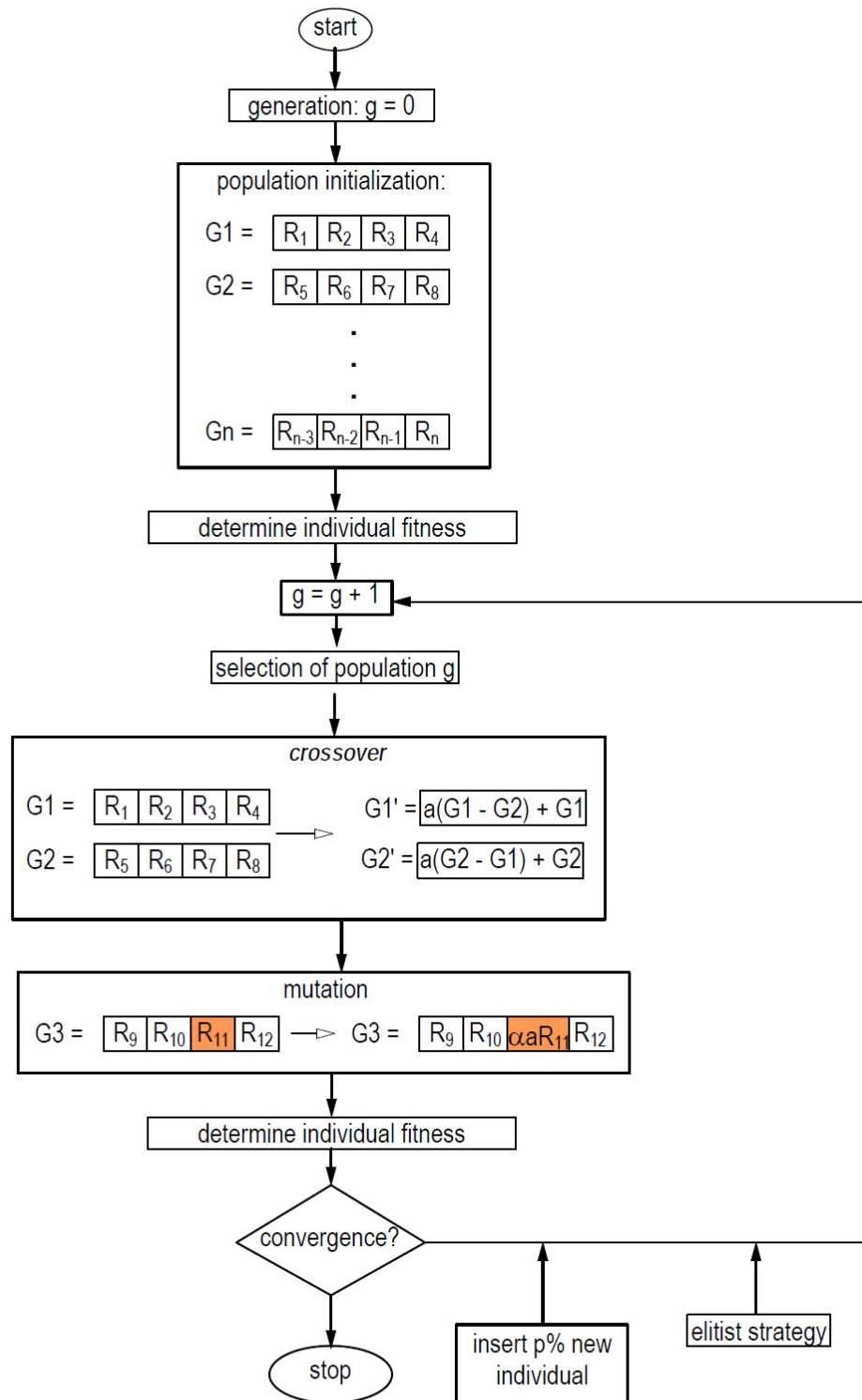


Fig. 2 Flowchart RC-GA used in this paper

To see the effectiveness of TTCDs on flexible pads in reducing structural reponse, the structures is simulated under El Centro 1940 NS, Kobe 1995 NS, Hachinohe 1968 NS and Northridge 1994 NS excitations scaled to 0.1g. The results of the simulation are shown in Table 2.

From Table 2, it is shown that the effectiveness of TLCDs in reducing vibration is different for different excitations. The most effective reduction is achieved under El Centro excitation, which can be as large as 45%. The response reduction under Northridge earthquake is not too effective; the reduction is only approximately 10%. From the table it is shown also that for the range of mass ratio under consideration, the effect of mass ratio is not significant. The time history response subject to Hachinohe 1968 NS for $\mu = 5\%$ is depicted in Fig. 4.

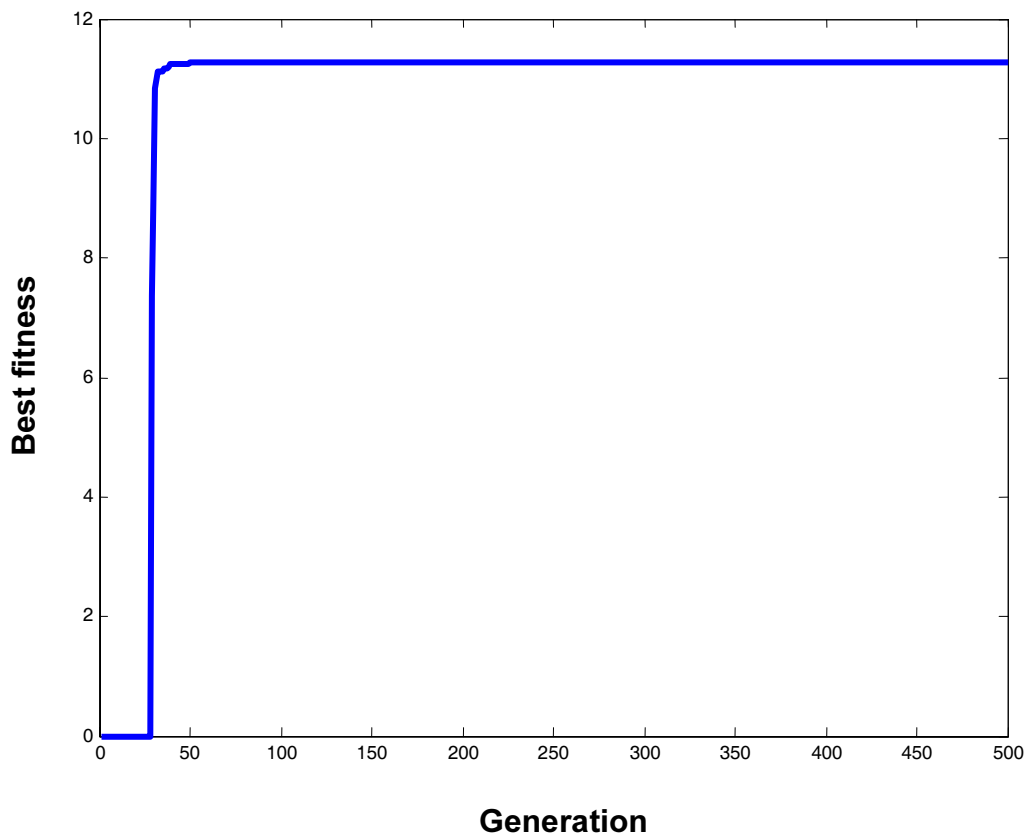


Fig. 3. Best fitness for $\mu = 10\%$

Table 2. Results of simulations for various earthquake

Displacement of structure		Response reduction (%)
El Centro	$\mu = 1 \%$	45
	$\mu = 5 \%$	44.8
	$\mu = 10 \%$	44.9
Kobe	$\mu = 1 \%$	34.9
	$\mu = 5 \%$	34.8
	$\mu = 10 \%$	34.8
Hachinohe	$\mu = 1 \%$	17.4
	$\mu = 5 \%$	17.4
	$\mu = 10 \%$	17.6
Northridge	$\mu = 1 \%$	9.9
	$\mu = 5 \%$	10.3
	$\mu = 10 \%$	10.7

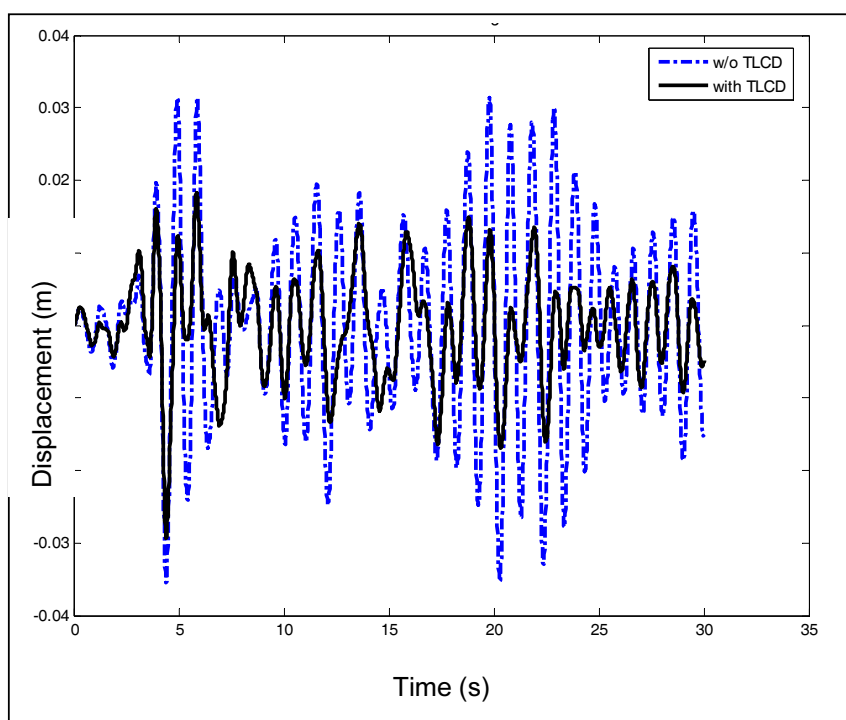


Fig. 4. Time history response due to Hachinohe 0.1 g for $\mu = 5 \%$

It is also interesting to see the ratio of width to the height of liquid in the tube. For the mass ratio $\mu = 5\%$, the values of α are varied. RC-GAs were utilized to obtain other properties of TLCDs. The resulting TLCDs properties is shown in Table 3.

Table 3. TLCDs properties for different α

α	A_y (m ²)	k_b (kN/m)	c_b (kN-s/m)	m_b (ton)	k_d (kN/m)	L (m)	B (m)	H (m)
0.1	0,377	104,34	19,867	8,703	7,399	2,05	0,27	0,89
0.2	0,368	103,94	20,131	8,860	7,221	2,72	0,54	1,09
0.3	0,372	104,13	20,32	9,060	7,3015	2,69	0,81	0,94
0.4	0,345	103,24	20,042	8,937	6,7603	2,90	1,16	0,87
0.5	0,350	102,19	20,716	9,344	6,8638	2,86	1,43	0,71
0.6	0,348	101,93	20,568	9,398	6,8335	2,87	1,72	0,57
0.7	0,345	100,52	21,617	9,994	6,7595	2,90	2,03	0,44

By using different values of α it can be shown that the same response reduction can be achieved as shown in Fig. 5.

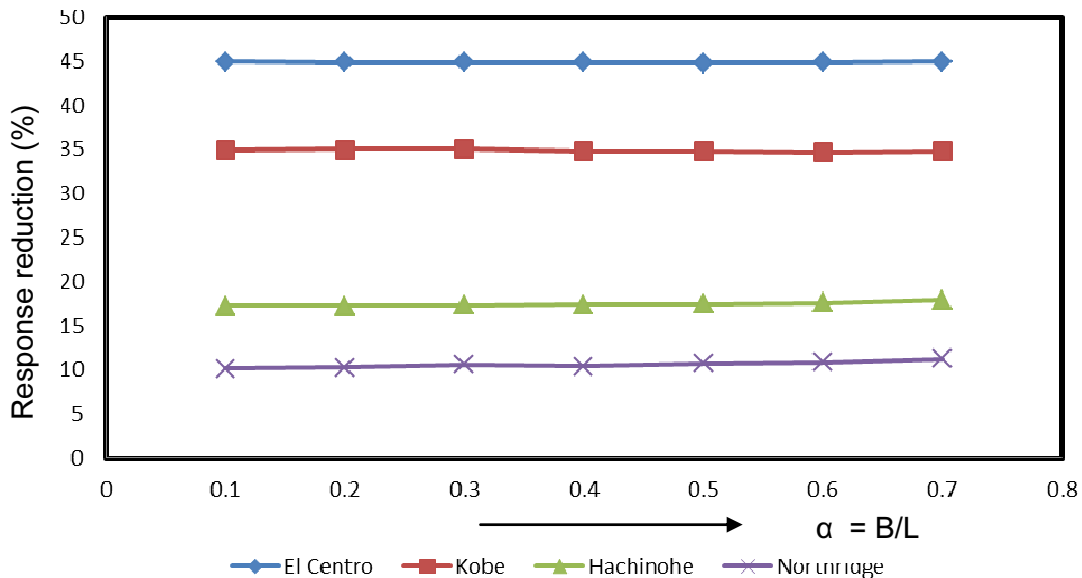


Fig. 5. Response reduction for different values of α

6. CONCLUSION

The optimization of TLCDs rest on the flexible support was carried out in this paper. RC-GAs were used to obtain the properties of TLCDs and their support. The objective function is taken as the H_2 norm of transfer function from disturbances to the regulated output. The regulated output is displacement of the structure. In the optimization, the lower bound damping inclusion from TLCDs is considered by taking value of C_d equals to zero. The structure was then simulated under El Centro 1940 NS, Kobe 1995 NS, Hachinohe 1968 NS and Northridge 1994 NS earthquakes. The effectiveness of TLCDs on flexible support in reducing the response is different for different excitations. The largest effectiveness is achieved under El Centro 1940 NS excitation, while the lowest one is due to Northridge 1994 NS earthquake. In the analysis, the influence of the mass ratio is also not significant to the response reduction. In addition, different values of ratio of width to height of liquid in the tube can be chosen with the same effectiveness of response reduction.

ACKNOWLEDGMENT

This research is sponsored by Directorate General of Higher Education, Ministry of Education and Culture, Republic of Indonesia under the Fundamental Research Grant scheme 2011-2012.

REFERENCES

- Arfiadi, Y (2007). "Flexible mounted tuned liquid column dampers for reducing structural response". *Proceedings of the 1st International Conference of European Asian Engineering Forum (EACEF)*. Jakarta, 26-27 September.
- Arfiadi, Y and Hadi, M. N. S. (2001). "Optimal direct (static) output feedback controller using genetic algorithms". *International Journal of Computer and Structures*, Vol. 79 No. 17, 1625-1634.
- Chang, C.H., Wu, J.C., Cheng, C.M., Lin, Y.Y. (2010). "Computational fluid dynamic simulation for horizontal movement tuned liquid column damper". *The fifth international symposium on computational wind engineering, Chapel Hill, North Carolina*, May 23-27.
- Chen, Y.H. and Chao, C.C. (2000). "Optimal damping ratio of TLCDs". *Structural Engineering Mechanics*, 9(3): 227-240.
- Doyle, J. C., Glover, K., Khargonekar, P. P. and Francis, B. A. (1989). "State-space solutions to standard H_2 and H_∞ control problems". *IEEE Transaction on. Automatic Control*, Vol. 34, No.8, 831-847.
- Grefenstette, J. J. (1986). "Optimization of control parameters for genetic algorithms." *IEEE Transaction on Systems, Man and Cybernetics*, Vol. 16, No. 1, 122-128.
- Hadi, M. N. S. and Arfiadi, Y. (1998). "Optimum design of absorber for MDOF structures". *Journal of Structural Engineering*, ASCE, Vol. 124, No.11, 1272-1280.

Herrera, F., Lozano, M. and Verdegay, J. L. (1998). "Tackling real-coded genetic algorithms: operators and tools for behavioural analysis". *Artificial Intelligence Review*, Vol. 12, 265-319.

Hithcock, P.A., Kwok, K.C.S. and Watkins, R.D. (1997). "Characteristics of liquid column vibration absorbers (LCVA)-I". *Engineering Structures*, 19(2), 126-134.

Holland, J. H. (1992). *Adaptation in natural and artificial systems*. MIT Press, Mass.

Michalkewicz (1996), *Genetic algorithms + data structures = evolution program*. Springer, Berlin.

Sadek, F., Mohraz B. and Lew , H.S. (1998). "Single and multiple tuned liquid column dampers for seismic applications". *Earthquake Enginnering and Structural Dynamics*, 27, 439-463.

Sakai, F., Takeda, S. and Tamaki, T. (1989). "Tuned liquid column damper- new type device for suppression of building vibration". *Proceedings of International Conference on High rise Building*, 926-931, Nanjing, China

Wu, JC. and Chang, CH. (2006). "Design table of optimal parameters for tuned liquid column damper responding to earthquake". *The 4th Internasional Conference on Earthquake Engineering*, Taipei, Taiwan, October 12-13, paper no. 165.

Yalla, S. K., Kareem, A. (2003). "Semi-Active Tuned Liquid Column Dampers: experimental study". *Journal of Structural Engineering, ASCE*, Vol. 129, 960-971

Yalla, S.K., Kareem, A. and Kantor, J.C. (2001). "Semi-active tuned liquid column dampers for vibration control of structures". *Engineering Structures* 23: 1469-1479.