

Earthquakes *and* Structures,

An International Journal

Volume 12, Number 2, February 2017

CONTENTS

- Pouyan Abbasi Maedeh, Ali Ghanbari** (Iran) and **Wei Wu** (Austria)
Estimation of elevated tanks natural period considering fluid- structure- soil interaction
by using new approaches 145
- Mohamed Elhebib Guellil, Zamila Harichane, Hakima Djilali Berkane**
and **Amina Sadouki** (Algeria)
Soil and structure uncertainty effects on the Soil Foundation Structure dynamic response 153
- Sara Hamidpour, Masoud Soltani and Mojtaba Shabdin** (Iran)
Probabilistic seismic assessment of structures considering soil uncertainties 165
- Guohua Sun, Qiang Gu and Youzhen Fang** (China)
A simplified normalized cumulative hysteretic energy spectrum 177
- Reyhaneh Eskandari, Davoud Vafaei, Javid Vafaei** (Iran)
and **Mohammad Ebrahim Shemshadian** (USA)
Nonlinear static and dynamic behavior of reinforced concrete steel-braced frames 191
- Junsheng Su** (China, New Zealand), **Rajesh Prasad Dhakal** (New Zealand),
Junjie Wang (China) and **Wenbiao Wang** (China)
Seismic performance of RC bridge piers reinforced with varying yield strength steel 201
- Yongfeng Fang, Bin Yan** (China) and **Kong Fah Tee** (UK)
Probabilistic reliability of micro-resonators with thermoelastic coupling 213
- Bartolomeo Pantò, Linda Giresini, Mauro Sassu and Ivo Calì** (Italy)
Non-linear modeling of masonry churches through a discrete macro-element approach 223
- Mahdi Adibi, Mohammad S. Marefat, Kamyar Karbasi Arani and Hamid Zare** (Iran)
External retrofit of beam-column joints in old fashioned RC structures 237
- Jahangir Khazaei, Azadeh Amiri and Mehrdad Khalilpour** (Iran)
Seismic evaluation of soil-foundation-structure interaction: Direct and Cone model 251



Earthquakes and Structures

Vol. 12, No. 2 (2017)

Techno-Press

ISSN : 2092-7614(print), ISSN : 2092-7622(online)

Earthquakes *and* Structures

An International Journal of
Earthquake Engineering & Earthquake Effects on Structures

Editors-in-Chief

Alexandros-Dimitrios G. Tsonos

Aristotle University of Thessaloniki, Greece

Nicos Makris

University of Central Florida, USA

Keh-Chyuan Tsai

National Taiwan University, Taiwan

Techno-Press

Volume 12, Number 2, February 2017

Honorary Editor-in-Chief

Dr. Shih-Chi Liu
Faculty Advisor
Int'l Institute for Urban Systems Eng. Southeast Univ. Nanjing, 210096, China
Tel: +86-25-83793232, E-mail: cggchi@gmail.com

Editors-in-Chief

Prof. Alexandros-Dimitrios G. Tsonos (European Ed.)
Dept. of Civil Engineering
Aristotle University of Thessaloniki, Greece
E-mail: tsonosa@civil.auth.gr

Prof. Nicos Makris (American Ed.)
Dept. of Civil Engineering
University of Central Florida, Florida 32816-2450, USA
E-mail: Nicos.Makris@ucf.edu

Prof. Keh-Chyuan Tsai (Asia-Pacific Ed.)
Dept. of Civil Engineering
National Taiwan University, Taipei 10617, Taiwan
E-mail: kctsai@ntu.edu.tw

Managing Editor

Prof. Chang-Koon Choi, Ph. D.
Dept. of Civil & Environmental Engineering
Korea Advanced Institute of Science & Technology, Daejeon 34141, Korea, E-mail: cck@kaist.ac.kr

Editorial Board (in alphabetical order)

| | | | |
|--|---|---|--|
| <div>Prof. A. Benavent-Climent University of Granada Granada E-18071, Spain</div> <div>Prof. Rita Bento Instituto Superior Tecnico 1049-001 Lisbon, Portugal</div> <div>Prof. Shuenn-yih Chang Nat'l Taipei Univ. of Tech. Taipei 106, Taiwan</div> <div>Prof. C.C. Chou National Taiwan University Taipei 10764, Taiwan</div> <div>Prof. Nawawi Chouw University of Auckland Auckland 1010, New Zealand</div> <div>Prof. M.C. Constantinou SUNY at Buffalo Buffalo, NY 14260, USA</div> <div>Prof. Rajesh Dhakal University of Canterbury Private Bag 4800, New Zealand</div> <div>Prof. Aurelio Gherisi University of Catania Catania 95100, Italy</div> <div>Prof. Russell A. Green Virginia Inst .Tech. Blacksburg, VA 24061, USA</div> <div>Prof. Jason Ingham University of Auckland Auckland 1010, New Zealand</div> <div>Prof. R.S. Jangid Indian Institute of Technology Mumbai 400076, India</div> | <div>Prof. R. Jankowski Gdansk University of Technology 80-233 Gdansk, Poland</div> <div>Prof. H.J. Jung Korea Adv Inst of Sci & Tech Daejeon 34141, Korea</div> <div>Prof. Theodore L. Karavasilis Seoul National University, Gwanak-gu, Seoul 08826, Korea</div> <div>Prof. Petros Komodromos University of Warwick Coventry, CV4 7AL, UK</div> <div>Prof. S. Lagomarsino University of Genoa Genova I-16145, Italy</div> <div>Prof. Nelson Lam SUNY at Buffalo Victoria 3010, Australia</div> <div>Prof. H.S. Lee Korea University Seoul 02841, Korea</div> <div>Prof. Chunxiang Li Shanghai Jiao Tong University Shanghai 200030, Peoples R China</div> <div>Prof. Dimitrios G. Lignos McGill University Montreal, Quebec H3A 2K6 Canada</div> <div>Prof. Jerome P. Lynch University of Michigan Ann Arbor, MI 48109-2125, USA</div> <div>Prof. C.S. Manohar Indian Institute of Science Bangalore 560 012, India</div> | <div>Prof. G. Manolis Aristotle University Thessaloniki 54124, Greece</div> <div>Prof. Angelo Masi University of Basilicata 85100 Potenza, Italy</div> <div>Prof. Jason P. McCormick University of Genoa Genova I-16145, Italy</div> <div>Prof. Yuji Miyamoto Osaka University Osaka 565-0871, Japan</div> <div>Prof. Fabrizio Mollaioli Sapienza University of Rome Rome 00197, Italy</div> <div>Dr. Naohiro Nakamura Takenaka Corporation Chiba 270-1395, Japan</div> <div>Prof. Camillo Nuti The University of Rome Three Rome 00184, Italy</div> <div>Prof. S.J. Pantazopoulou University of Cyprus Nicosia 1678, Cyprus</div> <div>Prof. Apostolos Papageorgiou University of Patras Patras 265 00, Greece</div> <div>Prof. Jorge Ruiz-Garcia Univ Michoacana de San Nicolas de Hidalgo Michoacan, Mexico</div> <div>Prof. Haluk Sucuoglu Middle East Technical University Ankara TR-06531, Turkey</div> | <div>Dr. Timothy Sullivan University of Pavia Pavia I-27100, Italy</div> <div>Prof. Izuru Takewaki Kyoto University Kyoto 615-8540, Japan</div> <div>Prof. J.L. Tassoulas University of Texas at Austin Austin, TX 78712-0273, USA</div> <div>Prof. Amador Teran-Gilmore Universidad Autonoma Metropolitana Mexico City 02200, Mexico</div> <div>Prof. T. Triantafyllou University of Patras Patras 265 00, Greece</div> <div>Prof. Tomaso Trombetti University of Bologna Bologna 40136, Italy</div> <div>Prof. Radu Vacareanu Technical U of Civil Engineering Bucharest RO-020396, Romania</div> <div>Prof. Aspasia Zerva Drexel University Philadelphia, PA 19104, USA</div> |
|--|---|---|--|

Manuscript Editor
Juri Yoo

Aims and Scope

The **Earthquakes and Structures**, An International Journal, focuses on the effects of earthquakes on civil engineering structures. The journal will serve as a powerful repository of technical information and will provide a high-impact publication platform for the global community of researchers in the traditional, as well as emerging, sub-disciplines of the broader earthquake engineering field. Specifically, some of the major topics covered by the Journal include:

- Characterization of strong ground motions,
- Quantification of earthquake demand and structural capacity,
- Design of earthquake resistant structures and foundations,
- Experimental and computational methods,
- Seismic regulations and building codes,
- Seismic hazard assessment,
- Seismic risk mitigation,
- Site effects and soil-structure interaction,
- Assessment, repair and strengthening of existing structures, including historic structures and monuments, and
- Emerging technologies including passive control technologies, structural monitoring systems, and cyberinfrastructure tools for seismic data management, experimental applications, early warning and response

Instructions to Authors

This Instruction to Authors is to provide help for authors who wish to submit their papers in double column format to Techno-Press journals. For the list of Techno-Press journals in double column format: Journals (http://www.techno-press.com/List_of_Journals.pdf)

1. Submission of the paper
Authors are asked to submit manuscripts in PDF (or Latex) format electronically through the Techno-Press Manuscript Upload System (TeMUS) (<http://www.techno-press.com/papers>). Exceptionally, some special issue papers may be directly submitted to the Guest Editor. If you have difficulties in using TeMUS, please contact us at [eas@techno-press.com]. On receiving submitted papers, the system will issue the paper ID and Password to the corresponding author, which may be conveniently used to check the review status of submitted papers.

2. Preparation of the manuscript
General: The manuscripts should be in English and typed with double column and single line spacing on single side of A4 paper. Submitted papers will be published in the category of regular technical papers only. The first page of an article should contain: (1) a title of paper which well reflects the contents of the paper (Arial, 15pt), (2) all the name(s) and affiliations(s) of authors(s) (Arial, 11pt), (3) an abstract of 100~250 words (Times New Roman, 9.5pt), (4) 5-10 keywords following the abstract, and (5) footnote (personal title and email address of the corresponding author (required) and other authors' (not mandatory)). The paper should be concluded by proper conclusions which reflect the findings in the paper. The normal length of the technical paper should be about 8-16 journal pages (double column format). Please refer to *Authors' Guide(A)* and *Template* for the format of the paper.
Authors' Guide(A): [http://www.techno-press.com/papers/Guide\(A\).pdf](http://www.techno-press.com/papers/Guide(A).pdf)
Template: [http://www.techno-press.com/papers/Template\(A\).docx](http://www.techno-press.com/papers/Template(A).docx)

Tables and figures: Tables and figures should be consecutively numbered and have short titles. They should be referred to in the text as following examples (e.g., Fig. 1(a), Figs. 1 and 2, Figs. 1(a)-(d) / Table 1, Tables 1-2), etc. Tables should have borders (1/2pt plane line) with the captions right before the table. Figures should be properly located in the text as an editable image file (.jpg) with captions on the lower cell. All of the original figures and tables are required to be placed at the suitable location in the text. It should be avoided whenever possible that a figure or table occupies both columns, in particular, it should not be stretched from one end to another.

Units and mathematical expressions: It is desirable that units of measurements and abbreviations should follow The International System of Units (SI) except where the other unit system is more suitable. The numbers identifying the displayed mathematical expression should be placed in the parentheses and referred to in the text as following examples (e.g., Eq. (1), Eqs. (1)-(2)). Mathematical expressions must be inserted as an object (set as Microsoft Equations 3.0) for Microsoft Word 2007 and later versions. Image-copied text or equations are not acceptable unless they are editable. The raised and lowered fonts cannot be used for superscription and subscription.

References: A list of references which reflect the current state of technology in the field locates after conclusions of the paper. For details to prepare the list of references and cite them in the text, authors are advised to follow the introductions and the sample list in the Authors' Guide(A) of this instruction.

3. Review
All the submitted papers that have passed the preliminary check by the editors will undergo a rigorous peer-review process to judge their significance and originality. Those papers positively recommended by at least two expert reviewers will be finally accepted for publication in the Techno-Press Journals.

4. Proofs
Proofs will be sent to the corresponding author to correct any typesetting errors. Alterations to the original manuscript will not be accepted at this stage. Proofs should be returned within 48 hours of receipt.

5. Copyright
Submission of an article to a Techno-Press Journal implies that it presents the original and unpublished work, and not under consideration for publication elsewhere. On acceptance of the submitted manuscript, it is implied that the copyright thereof is transferred to the Techno-Press. The Agreement of Authorship, Originality, and Copyright Transfer must be signed and submitted.

6. Ethics
Techno-Press applies research and publication ethics standards based on COPE's International Standards for Editors and Authors (<http://publicationethics.org/international-standards-editors-and-authors>). Violation of publication ethics will result in the activation of COPE flow chart. (<http://home.jeet.or.kr/Flowcharts.pdf>)

7. Publication Fee
Except for open access articles, there is no page charge or article processing fee for submission and publication in this journal.

Subscription information

The **Earthquakes and Structures**, *An International Journal* (abbr: Earthq. Struct. *Int. J.*) is published monthly on the 25th day of every month (inagurated in 2010). The basic subscription price (print+e) for 2017 including postage by surface mail is US\$516 for institutional subscription and US\$176 for personal subscription. For delivery by air mail, add US\$64. Subscription orders and/or inquiries should be sent to Techno-Press, P.O. Box 33, Yuseong, Daejeon 34186, Korea. Tel: (+82-42) 828-7995, Fax: (+82-42) 828-7997, E-mail: subs@techno-press.com