Coupled Systems Mechanics, *Vol. 10, No. 3 (2021) 199-200*
DOI: https://doi.org/10.12989/csm.2021.10.3.199

Special issue ACSM20: Advances in coupled systems mechanics 2020

Adnan Ibrahimbegovic*[1,2,3]

[1]*Universite de Technologie de Compiegne – Alliance Sorbonne Universite, 60203 Compiegne, France*
[2]*Chair of Computational Mechanics UTC*
[3]*IUF Institut Universitaire de France*

(Received January 1, 2021, Revised June 1, 2021, Accepted June 8, 2021)

Abstract. This special issue contains selected papers first presented in a short format at ACSM20 (Advances in Coupled Systems Mechanics) held at the Global Education Center for Engineers (GECE) in Seoul, Korea, August 25~29, 2020. ACSM20 was regrouped with 11 other International Conferences, all placed within the framework of The 2020 World Congress on Advances in Civil, Environmental, & Materials Research (ACEM20)/The 2020 Structures Congress (Structures20).

Keywords: coupled; systems; mechanics, special issue

1. Introduction

The 2020 World Congress on Advances in Civil, Environmental, & Materials Research (ACEM20)/The 2020 Structures Congress (Structures20) is organized every two years at different cities in Korea. This particular meeting was organized by: Int'l Association of Structural Engineering & Mechanics (IASEM), Korea Advanced Institute of Science & Technology (KAIST), Seoul National University, Korea Association of Computational Mechanics (KACM), in association with Techno-Press Journals (www.techno-press.org). ACEM20/Structures20 Congress was sponsored by Korea Federation of Science and Technology Societies, Seoul Metropolitan Government and Korea Tourism Organization.

The 2020 World Congress on Advances in Civil, Environmental, and Materials Research (ACEM20) and The 2020 Structures Congress (Structures20) was jointly held August 25-29, 2020 at Global Education Center for Engineers (GECE) in Seoul, Korea, by combining twelve International Conferences. One of those ACSM20: Advances in Coupled Systems Mechanics 2020 provided the basis for selecting the full paper contributions to this special issue.

2. Selected papers

The ACSM20 Conference topics that were addressed concerned not only ‘classical’ domains of

*Corresponding author, Professor, E-mail: adnan.ibrahimbegovic@utc.fr

http://www.techno-press.org/?journal=csm&subpage=8 ISSN: 2234-2184 (Print), 2234-2192 (Online)

Solid, Structural and Fluid Mechanics, but also a number of currently 'hot' domains, such as: Heterogeneous Materials, Complex Structures and Systems, Material and Structure Failures, Fluid-Structure Interaction, Multi-Phase Flows, Soil-Structure Interaction. The selected papers for this special issue are but a few illustrations of the ideas discussed during ACSM20 meeting.

In particular, in their work (Ibrahimbegovic and Mejia Nava 2021) have provided an interesting idea on how to replace the classical Rayleigh damping model with a much more comprehensive model for capturing different sources of energy dissipation, which can also reproduce typical dynamics response for different phases of earthquake excitation. This goal is accomplished by appealing to material-scale and judicious combination with structure heterogeneities description that allows recovering the characteristic exponential amplitude decay and an excellent fit for any size of the structure.

The contribution from (Ding and Ouahsine 2021) presents stability analysis of caisson-type breakwater using coupled fluid-porous-solid interaction model, with an original approach to failure risk in this important practical application.

The paper of (Nguyen *et al.* 2021) provides an interesting review of different manner to achieve the most efficient plate finite element formulation and discrete approximation, outlining a number of the most robust choices that can grant an excellent model performance.

A couple of other papers deal with different aspects of an important application domain in earthquake engineering. The paper of (Soelarso *et al.* 2021) deals with soil-structure interaction problem, for a particular case of shallow foundation of the soft soil. The paper by (Nava *et al.* 2021) provides an interesting model for energy dissipation mechanism of concrete structures subjected to earthquake, by using the classical homogenization procedure and viscoelastic model.

Rather than making more detailed observations and remarks on the content of each of the selected contribution, we invite the CSM readers to carry on with their own exploration, hoping it will be very fruitful for each one of them.

Acknowledgments

The research described in these papers was financially supported by number of funding organizations. All financial support is gratefully acknowledged.

References

Ding, D. and Ouahsine, A. (2021), "Stability of caisson-type breakwater using coupled Fluid-Porous model", *Coupl. Syst. Mech.*, **10**(3), 000-000.

Ibrahimbegovic, A. and Mejia Nava, R.A. (2021), "Heterogeneities and material-scales providing physically-based damping to replace Rayleigh damping for any structure size", *Coupl. Syst. Mech.*, **10**(3), 000-000.

Mejia Nava, R.A., Ibrahimbegovic, A., Dominguez-Ramirez, N. and Flores-Mendez, E. (2021), "Viscoelastic behavior of concrete structures subject to earthquake", *Coupl. Syst. Mech.*, **10**(3), 000-000.

Nguyen, C.U., Batoz, J.L. and Ibrahimbegovic, A. (2021), "Notable highlights on locking-free techniques of Reissner-Mindlin plate finite elements in elastostatics", *Coupl. Syst. Mech.*, **10**(3), 000-000.

Soelarso, S., Antaluca, E., Batoz, J.L. and Lamarque, F. (2021), "On the finite element modeling of a particular shallow foundation system for soft soil", *Coupl. Syst. Mech.*, **10**(3), 000-000.