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Editorial

Forward to: Recent development of earthquake engineering and soil dynamics for large-scale infrastructure

The last decade has seen tremendous growth in the development of large-scale infrastructures, such as high-rise buildings, sub-ways, high dams and high-speed railways. It is becoming increasingly necessary to improve the seismic assessment, design, enforcement and retrofit of these key infrastructures. In this context, engineers and researchers in the area of soil dynamics and geotechnical earthquake engineering have taken great efforts to overcome numerous technical difficulties and made significant achievements. Therefore, we believe there is urgent need to sketch recent advances and existing challenges in this area especially for large-scale infrastructures, with particular emphasis on novel theories and technologies. Soil Dynamics and Earthquake Engineering (SDEE) is an appropriate journal for this purpose.

The special issue features 13 scientific papers on recent development of earthquake engineering and soil dynamics for large-scale infrastructure. Papers [1–4] study the soil structure interaction problems related to large-scale infrastructures, including foundation excavation, high-speed railways and urban subways. Papers [5–8] present recent advances in soil liquefaction and its associated damage to large-scale infrastructures using case-history data, shake table test, laboratory model test, and numerical simulation. [9–10] study dynamic properties of saturated soils and frozen compacted sands. [11] reports a coupled hydro-thermo-mechanical model developed for seismic responses of embankments in permafrost regions. [12–13] present ground motion simulation, damage assessment and enforcement methods for dams.

Although the papers selected in this special issue can only cover a limited number of challenges and solutions, it highlights the fact that geotechnical earthquake engineering is playing an increasingly important role in the development of large-scale infrastructures, from which more fruitful research is expected to come in the near future. Finally, we thank all the authors and reviewers for their valuable efforts and great contributions to the special issue.

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