

Seismic Ground Motions and Their Application in Structural Engineering

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Deadline for manuscript
submissions:

30 September 2024

Message from the Guest Editors

Seismic ground motions play a crucial role in structural engineering, influencing the design, analysis, and performance of buildings under earthquake loading. Understanding the characteristics and behavior of seismic ground motions is essential for engineers to develop effective strategies for mitigating earthquake-induced damage and ensuring the safety and resilience of structures. By studying the amplitude, frequency, duration, and directionality of ground motions, engineers can assess the seismic hazard and design structures that can withstand various levels of earthquake shaking. Advanced analytical tools, such as finite element analysis and dynamic structural modeling, are employed to accurately simulate the response of structures to seismic ground motions. Additionally, seismic ground motion data are utilized in the development and refinement of building codes and seismic design standards, guiding engineers in designing structures that meet stringent safety requirements and contribute to the overall resilience of communities in earthquake-prone regions.



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Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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