

Editorial

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## Disaster Prevention and Resilience: article introduction in First Issue in Volume 3

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*Disaster Prevention and Resilience* (DPR) has published 33 high-quality papers since its founding edition in June 2021, including 1 Editorial, 28 Research Articles, 3 Reviews, and 1 Perspective. Based on statistics, these publications have amassed 34,094 views and 14,021 downloads. In 2023 alone, *DPR* published 4 issues, featuring a total of 23 articles. This marks a remarkable increase of approximately 65% compared to the previous two years, indicating significant and gratifying progress.

Here, we sincerely express our gratitude to the diligent efforts of the editorial team, the quality control of the editorial board members, the active participation of the young editorial committee members, and the rigorous review of the reviewers. It is through your hard work that the journal has made such significant progress.

At the beginning of 2024, we welcomed the release of the first issue, and we invite readers to explore the exciting discoveries in Volume 3, Issue 1 of the “Journal of Disaster Prevention and Resilience”. In this issue, we are proud to present three outstanding research articles that address some key issues in disaster prevention and response and provide new insights and solutions for strengthening social resilience and disaster management.



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The first article, titled “Isolated shallow rocking foundation on different soils with varying embedment depth”<sup>[1]</sup>, authored by R. Manoj Kannan, Putul Haldar, and Naveen James from India, mainly study and investigate the efficacy of shallow rocking foundations in dissipating seismic energy and improving overall structural stability. Key parameters, including soil types and embedment depth, are analyzed alongside rocking foundation effectiveness on seismic force and displacement demands of reinforced concrete buildings. Results indicate that rocking foundations reduce seismic force demands while slightly increasing displacement demands, with efficacy independent of embedment depth. Additionally, the study compares rocking foundations with conventional designs and finds significant reductions in roof acceleration and seismic moment, particularly in dense soil types. The findings suggest that under-proportioned footings can effectively reduce seismic force demands on dense soil, although further nonlinear finite element analysis is needed to understand failure mechanisms associated with embedment depth. Overall, the study highlights the beneficial effects of rocking foundations in seismic design.

The second article, “Time-domain instability mechanism for artificial boundary condition of semi-infinite medium described by discrete rational approximation”<sup>[2]</sup>, written by Zhenyun Tang, Boxin Fu, and Xin Li from China, addresses the instability issue in time-domain analysis of soil-structure interaction with discrete rational approximation functions representing foundation dynamic impedance. It establishes the closed-loop transfer function of the coupled system and analyzes instability causes through gain margin analysis. The main finding is that instability arises when discrete rational approximation functions exhibit errors beyond their fitting frequency range, distorting dynamic characteristics at high frequencies. The study explores the effects of soil and structural characteristics, along with discrete-time steps, on system stability. Limitations include the inability to address soil nonlinearity and consideration of single deformation types only, which will be investigated in future research.

Lastly, the third article, “A domain decomposition solver for spectral stochastic finite element: an approximate sparse expansion approach”<sup>[3]</sup>, authored by Bowen Luo, Wen Cao, Zheng Zhou, and Hongzhe Dai from China, proposes an approximate sparse expansion-based domain decomposition solver for spectral stochastic finite element (SSFE) analysis. The method aims to tackle the computational challenges associated with solving the extended Schur complement (e-SC) system in SSFE by introducing an approximate sparse expansion technique. This technique reduces the computational burden by transforming the e-SC matrix-vector multiplication into operations involving smaller subdomain-level augmented matrices and vectors. An approximate sparse preconditioner is also developed to accelerate the convergence of the preconditioned conjugate gradient method used in solving the e-SC system. The developed solver significantly enhances the computational efficiency of SSFE, enabling it to handle large-scale engineering systems for uncertainty quantification. Two numerical examples, involving stochastic analysis of a thin square plate and a planar frame structure, demonstrate the effectiveness of the proposed method in improving the efficiency of stochastic response analysis regardless of the number of subdomains or the variance of the random field.

These three research articles offer valuable perspectives on critical issues in disaster prevention and resilience and provide new ideas and methodologies for understanding and responding to various disasters. We hope these findings will inspire more scholars to engage with disaster management and response strategies and work together to build safer and more resilient societies.

Furthermore, we sincerely invite scholars to contribute their research results in the domain of disaster prevention and resilience to the Journal of *DPR*. We welcome original and cutting-edge research articles, reviews, technical reports, and reviews covering, but not limited to, earthquake engineering, flood

management, climate change adaptation, emergency response, and social resilience. We eagerly anticipate sharing and advancing this area with you.

## DECLARATIONS

### Authors' contributions

Writing and revision of the article and approval of the final version: DPR Editorial Office

### Availability of data and materials

Not applicable.

### Financial support and sponsorship

None.

### Conflicts of interest

The author declared that there are no conflicts of interest.

### Ethical approval and consent to participate

Not applicable.

### Consent for publication

Not applicable.

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## REFERENCES

1. Kannan RM, Haldar P, James N. Isolated shallow rocking foundation on different soils with varying embedment depth. *Dis Prev Res* 2024;3:1. [DOI](#)
2. Tang Z, Fu B, Li X. Time-domain instability mechanism for artificial boundary condition of semi-infinite medium described by discrete rational approximation. *Dis Prev Res* 2024;3:2. [DOI](#)
3. Luo B, Cao W, Zhou Z, Dai H. A domain decomposition solver for spectral stochastic finite element: an approximate sparse expansion approach. *Dis Prev Res* 2024;3:3. [DOI](#)