

Editorial

Xianfeng Ma

Chair of the Editorial Board of IJPMG; School of Civil Engineering,
Kashi University, Kashi, China; Department of Geotechnical Engineering,
Tongji University, Shanghai, China

It is always much pleasure to share with readers new development, interesting findings and innovative works in the field of physical modelling in geotechnics, in which this journal is fully dedicated. As the editor in chief of this journal, I have the privilege of seeing many fascinating manuscripts and has often been amazed by the continuous emerging of interesting and valuable contents ranging from new test apparatus, instrumentation, simulation methods for traditional geotechnical topics and that of new horizons. I believe this is demonstrating the vivid and vibrant status of the research activities within the community, and I sincerely agree with my colleagues' remarks in previous editorials that in the era of machine learning and artificial intelligence research booming, physical model tests play a more important role by providing high quality data and deep insights into complicated mechanism in the process of geotechnical engineering.

This May issue of International Journal of Physical Modelling in Geotechnics is again an example of showcasing the broad and innovative works conducted in this dynamic community. Four papers are included in this issue, featuring development of new instrumentation approach for pore water pressure along shear surface in liquefied soil, insights into geosynthetics reinforced soil foundation, earth pressure of unsaturated sand acting on retaining wall and performance and monotonic uplift of the bucket foundation in clay considering installation effect. The first paper by Chen *et al.* (2025) presents an improved approach measuring porewater pressure along shear surface during liquefaction. Two of the most significant improvement include in-flight cone penetration tests (CPT) and shear-wave velocity (VS) measurement for detailed characterization of the soil, together with a miniature pressure transducer embedded in the coupon surface to measure pore pressure response at the interface. These improvements ensure high quality data in terms of accurate soil characterization and lead to reliable interpretation of the results. The authors make detailed discussion on the behaviour of liquefied soil around the surface in the whole process and valuable insights into the liquefied strength and post-shake strength are presented.

In the second paper of this issue, Guo *et al.* (2025) focus on bearing capacity of shallow circular footing on geogrid reinforce sand and conduct relatively large scale 1g tests to understand the load and deformation behaviors and reinforcing effects particularly.

Five sets of plate loading tests are carefully designed and conducted, and informative results have been yielded which are helpful in getting insights into the relationship between efficiency of reinforcement and footing settlement, the distribution of tensile strain in both geogrid and soil layers and the influence of geogrid spacing and reinforcement layer number.

While earth pressure on retaining walls is a traditional geotechnical engineering topic, Gourgani *et al.* (2025) investigate some new aspects relating to it. Fourteen retaining wall models in unsaturated and dry conditions are designed and focus are put on the interaction between unsaturated sand and rigid retaining wall with various movement modes: translation, rotation about base and rotation about top etc. The results of the model tests show that suction of the soil has strong relationship with nonlinear distribution and value of the earth pressure behind the wall. Based on the results, an equation is presented to estimate the load that backfill imposed on the wall in similar soils, which is potentially useful in engineering practice with similar conditions.

In the last paper of this issue, Han *et al.* (2025) presents studies on performance of the bucket foundation aiming to solve uncertainties associated with the installation and monotonic uplift of the foundation in clay, which is continuously an active research area supporting wind turbine industry. The feature in their work is that both physical model tests and finite element analyses are carried out to simulate the installation and vertical uplift of the bucket foundation, which makes the results more reliable and accurate by crosschecking each other. The results indicate that the skirt with external chamfer is beneficial in terms of increasing bearing capacity. Although overloading during installation reduces maximum uplift capacity, it significantly increases the maintained displacement of suction and thus is beneficial for the stability of under uplift loading.

I sincerely hope that the above papers interest you and be helpful for your research work. I am also eager to read exciting works, further discussions or notes etc. in the near future from your research group probably enlightened by the work this journal presents to you. Finally, let me conclude the editorial by expressing my gratitude towards the combined support from authors, reviewers and support teams of this journal.

REFERENCES

- Chen J, Olson SM, Banerjee S, Dewoolkar MM and Dubief Y (2025) Novel pore pressure measurements along a shear surface in liquefied soil. *International Journal of Physical Modelling in Geotechnics* **25(3)**: 141–160, <https://doi.org/10.1680/jphmg.22.00060>.
- Gourgani M, Razeghi HR and Mamaghanian J (2025) Interaction of unsaturated sand with a retaining wall under various active movements. *International Journal of Physical Modelling in Geotechnics* **25(3)**: 177–193, <https://doi.org/10.1680/jphmg.23.00036>.
- Guo X, Chen J, Huang Q and Yu S (2025) Large-scale model tests on performance of shallow circular footings on geogrid-reinforced sand. *International Journal of Physical Modelling in Geotechnics* **25(3)**: 161–176, <https://doi.org/10.1680/jphmg.23.00031>.
- Han C, Li K and Liu J (2025) Investigation on the installation and monotonic uplift performance of bucket foundation in clay. *International Journal of Physical Modelling in Geotechnics* **25(3)**: 194–206, <https://doi.org/10.1680/jphmg.24.00047>.