

Editorial

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Themed Issue on the UKACM 25th Conference on Computational Mechanics – Part 2



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It gives us great pleasure to present to you the second part of the UKACM 2017 themed issue. The 25th UKACM (UKACM 2017) was hosted by the University of Birmingham on 12-13 April 2017 and was attended by over 100 researchers from both the UK and overseas. With over 70 papers across various disciplines including solid and structural mechanics; failure, fracture and damage; geo-mechanics; fluid mechanics and biomechanics, the conference provided an opportunity to foster new ideas and collaborative research links, building strong research links within the UK and at international level. Selected authors were invited, based on the originality and rigour of their submissions, to extend their conference papers and submit them for publication in a two-part themed issue of the *Proceedings of the Institution of Civil Engineers - Engineering and Computational Mechanics*.

This second part of the Themed Issue includes three papers. The first paper, by Ciantia et al. (2019), presents a new procedure to initialise large-scale discrete element models. The authors use random cells to generate representative elementary volumes (REV) that matches the desired properties. Once the cell is in equilibrium it will be used in a repetitive manner to build the problem domain. The presented approach in this paper results in computational efficiency of large-scale DEM problems.

In the second paper, Mahdavian and Javadi (2019), present a three-phase hydro-mechanical model to simulate hydraulic fracturing. The authors couple two simulators to model multiphase fluid flow in fractured rock that experience a wide range of deformations from linear elastic to large, non-linear inelastic. The coupled flow-geomechanics model is used to simulate the interaction between fluid flow inside the fractures with rock deformations. The authors use an iterative process to link pore pressure and strains to calculate changes in reservoir parameters. In addition, they carry out a parametric study to show the impact of geomechanical and fluid parameters on hydraulic fracture propagation.

The third and final paper in this Themed Issue uses limit-equilibrium and finite-element methods to model and analyse geometrically non-homogeneous stratified slopes with the aim of understanding the effects of non-homogeneity of geometry and materials on stability under various inclination angles of slope face. Sauffisseau and Ahangar-Asr (2019) investigate the complex problem and based on the results the authors generate a number of key practical conclusions that can be used by urban designers and geotechnical engineers to achieve more efficient designs of slopes and sustainable construction works.

We hope that you find this Themed Issue, helpful and motivating. We would like to thank the authors who prepared their papers, and the reviewers who carefully considered every paper ensuring the quality of this Themed Issue. We would also like to express our gratitude to the Editorial Panel for *Proceedings of the Institution of Civil Engineers - Engineering and Computational Mechanics* for availing us the opportunity to guest-edit this Themed Issue. Finally, we would like to thank Ms Cherise Lopes-Baker and Mr Paul Allanson for their continuous support throughout the process of preparing this Themed Issue.

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