

Chinese association for computational mechanics: Frontier in computational engineering

China is one of those developing countries all over the world that have the fastest developing speed, including the level of science and technology. During recent 30 years, many enormous achievements have been accomplished by Chinese people in various high-tech areas, such as aerospace engineering, hydraulic engineering, civil engineering, high-speed railway system, energy engineering, supercomputer, advanced manufacture, automotive engineering and so on. In these fields, the computational mechanics often plays a key role for related designs and analyses. It is interesting to see how Chinese researchers use computational mechanics to solve the complicated engineering problems, and how they develop new principles, techniques, algorithms, and schemes to improve precision, efficiency, robustness and applicability of the computational mechanics.

Chinese Conference on Computational Mechanics in conjunction with the 6th International Symposium on Computational Mechanics' 2018 (CCCM-ISCM 2018) was successfully held in Nanjing, China, on August 19-23, 2018. The aim of this conference is to promote the comprehensive and deep academic exchanges and discussions on the research and applications of computational mechanics both in China and around the world. Totally 549 abstracts were received, and 68 parallel sessions covering 29 topics, 550 oral reports including 17 plenary lectures were organized by the conference. More than 700 delegates, including some top scholars from China, the USA, the UK, Australia, Germany, France, Singapore, etc., attended the grand event.

To exhibit the latest ideas, developments and applications in the field of computational mechanics, with a special emphasis on the contributions accomplished by Chinese researchers, Chinese Association for Computational Mechanics (CACM) decided to organize a special issue in *Engineering Computations* by selecting some impressive presentations at the conference. In all, 20 research articles are finally accepted for publication in this special issue, which have provided a fairly complete review of the current research in developments and applications of computational mechanics. The topics covered by this special issue include:

- *Computational solid Mechanics*, including high-performance finite element methods (works of Cen, Wu, Li, Shang and Li), high-performance boundary element method (works of Yao, Zheng, Yuan and Feng) and meshfree method (works of Qi, Wang, Deng, Xu and Wu).
- *Computational Fluid Mechanics*, including CFD-DEM coupled method (works of Wang, Walayat and Liu), finite element method (works of Gao and Liu), and parallel algorithms (works of He, Zheng, Zheng, Chen, Zhou and Xiao).

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- *Computational thermodynamics*, including refined bond-based peridynamics for thermal diffusion (works of Gu, Zhang and Madenci).
- *Computational solid-fluid coupled mechanics*, including coupled MMALE-FE method (works of Chen and Zhang).
- *Computational material mechanics*, including modeling of Pia Matter on Cortical Folding (works of Wang, Yao, Ning, Wu, Sun and Hu), statistical method for void structure (works of Zhou, Xue, Gou and Shen), and FEM simulation on shape memory polymer stent (works of Liu, McGinty, Cui, Luo and Liu).
- *Multiscale simulation method and analysis*, including new scheme for imposing periodic boundary conditions on RVE (works of Li, Zhang and Duan), hybrid FE-meshfree method (works of Wu and Zheng), and simulation on helically wound structures (works of Yan, Hu, Yang, Wan and Li).
- *Structural Analysis and Numerical Simulation*, including analysis of multilayered flexible riser (works of Liu, Li, Chen and Ju), modeling of the thin-walled square tube (works of Liu, Ding and Tong), direct topological reanalysis algorithm (works of Yang, Song and Chen), and simulation on ship motion (works of Zhuang and Wan).
- Engineering fracture analysis, including theoretical and numerical models (works of Wang, Liu, Gao, Ye and Zhuang) and numerical modeling (works of Zeng, Liu, Wang, Gao and Zhuang)

It is hoped that the great diversity of presented topics that cover the state-of-the-art research on computational mechanics will give this Special Issue a much more lasting value and make it appealing to a broad audience of researchers, practitioners and students who are interested in computational mechanics, and each reader can find in this special issue something useful or inspiring.

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