

Preface

Scientific Computing in Petroleum Industry (SCPI)

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With the rapid advent of modern computers, especially with better understanding of accuracy, stability and convergence of modern numerical algorithms, it is possible to design fast and reliable computer programs to simulate more and more complicated processes in oil reservoirs. This offers great helps in predicting, planning and designing of oil and gas explorations and productions. Simulation for petroleum industry is a task involving inter-disciplinary collaborations. It involves reservoir and chemical engineering, geophysics, numerical mathematics and computer sciences. The International Conference on "Scientific Computing in Petroleum Industry (SCPI)" was trying to bring scientists from different disciplines together and communicate on new and better simulation methods for petroleum related problems. The conference was held at Jihua SPA and Resort in Beijing, China from August 4-7, 2004. Scientists from 10 countries have taken part in the conference. The talks delivered at the conference cover a wide range of topics including the following:

- parameter estimation and level set methods
- large scale reservoir numerical simulation,
- continuation and subsurface imaging in seismic exploration,
- automatic history matching
- fractured reservoir simulations,
- numerical simulations for sedimentary basins

Many modern and new numerical techniques are discussed and presented in the conference. Domain decomposition methods, preconditioning techniques, methods of characteristics, mixed finite element methods, splitting techniques, unstructured mesh techniques and multiscale methods are among the topics presented in the conference.

This special issue of the journal contains a selected collection of contributions to the processing of the conference. All the contributions have gone through a standard peer review process of the journal. The selected publications contain research work on numerical simulation aspects of the reservoir simulations as well as computer vision and planning of tasks related to petroleum industry.

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Without the tremendous efforts of the organizing committee of the conference, it would have been impossible for this conference and proceeding to come to place. The scientific committee for the conference, chaired by Qiang Du, Jiachang Sun and Guanquan Zhang, with members: Zhangxing Chen, Long'an Ying, Yirang Yuan, Jianwen Cao, Zhemin Zheng, Hengyi Zeng, Zhongci Shi, Dakuang Han, Zaitian Ma, deserves a special thank for creating the high quality of the conference. The local organizing committee consists of: Yucheng Li, Weiyuan Wang, Yingxiang Wu, Shenghou He, Zhiming Chen have contributed to the practical work in organizing the conference. The financial supports from the following contributors are gratefully acknowledged:

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About the managing editors of this special issue



Dr. Jiachang Sun, Professor Jiachang Sun graduated from the Chinese University of Science and Technology in Beijing in 1964. He has worked in several institutes of the Chinese Academy of Sciences (CAS). He was employed as an associate professor at Computing Center of the CAS in 1981 and as a professor since 1987. He is now a chief professor of the Institute of Software. His research interests is High Performance Scientific Computing, include Multivariate Approximation , Fast Algorithms, Preconditioned Iterative Methods and Parallel Computing. He has published two books and more than one hundred papers.



Dr. Xue-Cheng Tai, Xue-Cheng Tai received Licenciate degree in 1989 and PhD in 1991 in applied mathematics from Jyvaskalya University in Finland. After holding several research positions in Europe, he was employed as an associate professor in 1994 at the University of Bergen, Norway and as a professor since 1997. He has also worked as a part time Senior Scientist at a private company "Rogaland Research". He is now a member of "Center for Mathematics for Applications" in Oslo and a member of "Center of integrated Petroleum Research" in Bergen. His research interests include Numerical PDE, multigrid and domain decomposition methods, iterative methods for linear and nonlinear PDE problems and parallel computing. He has educated numerous master and PhD students. He has been reviewer and editor for several international journals.

