

Report on FEM2014

The 12th International Workshop on Finite Elements for Microwave Engineering – FEM2014 – was held from May 14 to 17, 2014, in Mount Qingcheng, Chengdu, China. It was organized by the University of Electronic Science and Technology of China (UESTC) and the University of Illinois at Urbana-Champaign (UIUC), cosponsored by the Electronic Information Control Key Laboratory at Chengdu, International Joint Research Project (“111” Project), Computational Electromagnetics Chapter of Chinese Computational Physics Society, IEEE Chengdu Section, IEEE AP/EMC Joint Chengdu Chapter, and Antenna Society of Chinese Institute of Electronics, and technically cosponsored by the Nanjing University of Science and Technology (NJUST), Beijing Institute of Technology (BIT), and the University of Hong Kong (HKU).

The International Workshop on Finite Elements for Microwave Engineering is a highly focused biannual event. It provides an ideal forum for researchers to share their experience and achievements with the theoretical development and practical applications of finite-element methods to radio-frequency and microwave engineering problems. Previous workshops were held in Sienna, Italy, in 1992 and 1994; Poitiers, France, in 1998; Boston, Massachusetts, in 2000; Chios, Greece, in 2002; Madrid, Spain, in 2004; Stellenbosch, South Africa, in 2006; Bonn, Germany, in 2008; Meredith, New Hampshire, in 2010; and Estes Park, Colorado, in 2012.

FEM2014 had 125 attendees from ten countries: USA, Belgium, Germany, Israel, Poland, Singapore, South Africa, Spain, Switzerland, and China (including Hong Kong). The delegates came to Mount Qingcheng from 49 institutions on four continents, with 89 papers accepted for oral representation, including 46 papers from overseas.

The workshop took place in the Qingcheng (Howard Johnson) International Hotel (Figures 1 and 2), located at the foot of Mount Qingcheng, one of the birthplaces of Chinese Taoism. Mount Qingcheng (Figures 3 and 4) has numerous Daoist temples and sites along the paths to its peak. The area is green all year around, and is known for its secluded tranquility. With its annually average temperature of 15°C, Mt. Qingcheng has a humid subtropical monsoon climate. It is reputed as “Dong Tian Fu Di” (which means a wonderful mountain and happy place) and “the fairyland on Earth.”

The FEM2014 technical program was organized into the following 13 special sessions (the session organizers, who secured top-quality papers and also served as session chairs, are listed in parentheses):

- S1 Advanced FEM and Hybrid Techniques
(Branislav Notaros, Thomas Eibert)
- S2 Domain Decomposition Methods
(Jin-Fa Lee, Zhen Peng)

- S3 Discontinuous Galerkin Methods
(Qing-Huo Liu, Li-Jun Jiang)
- S4 Moment Method and Integral Equation Solvers I
(Amir Boag, Eric Michielssen)
- S5 Multi-Physics Modeling
(Wen-Yan Yin)
- S6 Advanced Computational Modeling and Applications
(Zhi-zhang Chen, Jun-Hong Wang)
- S7 CEM Activities in China
(Xin-Qing Sheng, Ming-Yao Xia)
- S8 Advanced FEM and Generalized FEM
(Balasubramaniam Shanker, Raphael Kastner)
- S9 Moment Method and Integral Equation Solvers II
(Magdalena Salazar-Palma, Mei Song Tong)
- S10 Fast Direct FEM Solver for Large Scale EM Analysis
(Haixin Liu, Qing He, Dan Jiao)
- S11 Time-Domain FEM
(Ru-Shan Chen, Su Yan)
- S12 Parallel Algorithms on Multi- and Many Cores Computers: Theory and Practice
(Vitaliy Lomakin, Ali Yilmaz)
- S13 Optimization Techniques and Parameter Space Sweep
(Romanus Dyczij-Edlinger, Sheng Sun)

The presentations ran in two parallel tracks in two adjacent halls: Taian Hall (Figure 5) and the Longchi Hall (Figure 6), in two completely packed conference days, May 15 and 16, 2014. These tracks covered a variety of cutting-edge applications of FEM and related computational techniques, including advanced finite-element and hybrid techniques, domain-decomposition methods, discontinuous Galerkin methods, generalized FEM, multi-physics modeling, direct solvers, optimization techniques, and parameter space sweep. The attendance was excellent and uniform at all presentations in both rooms.

A special commercial-software show was also arranged in Dagan Hall in the afternoon of May 16, in order to provide students and colleagues in computational electromagnetics an opportunity to learn the latest advances in leading commercial software. Dagan Hall was located on the same floor, and so it was very convenient for attendees to join. The representatives from ANSYS, CST, FEKO, and Science Park of UESTC introduced their recent progress.



Figure 1. The FEM2014 hotel: Howard Johnson Conference Resort Chengdu, located at the foot of Mount Qingcheng, one of the birthplaces of Chinese Taoism.



Figure 4. Beautiful Lake in Mount Qingcheng.



Figure 2. The FEM2014 restaurant: Maya Cafe in Howard Johnson Conference Resort Chengdu, where breakfast, lunch, and dinner were served and the reception was held.



Figure 5. The technical sessions in Taian Hall.



Figure 3. Mount Qingcheng, one of the birthplaces of Chinese Taoism, called “Dong Tian Fu Di” (which means a wonderful mountain and happy place). It was only a walking distance from the FEM2014 hotel, and many attendees hiked over there.



Figure 6. The technical sessions in Longchi Hall.



Figure 7. Past AP-S President, Prof. Magdalena Salazar-Palma, presented her HOFEM (higher-order finite-element method) work at FEM2014.

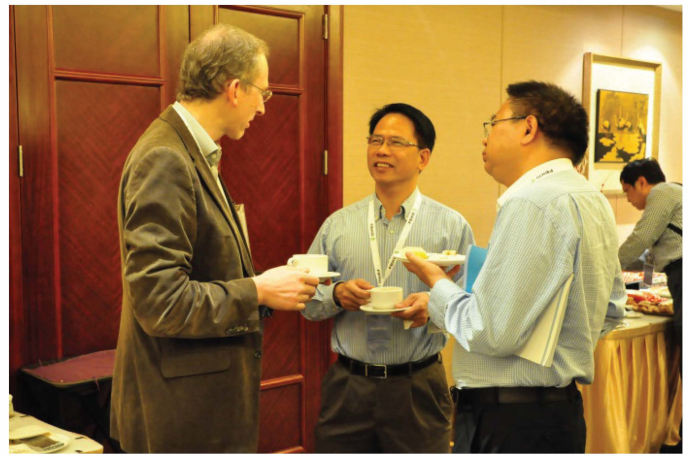


Figure 10. Attendees enjoyed the cultural exchange between the East and West during the coffee/tea breaks in the corridor outside of conference room: (l-r) Profs. Thomas Eibert, Qinghuo Liu, and Wenyan Yin.



Figure 8. Special session organizer and chair, Prof. Amir Boag, presented his work, “Moment Method and Integral Equation Solvers,” at FEM2014.



Figure 11. A moment to meet old and new friends took place during the breaks (l-r): Profs. Raphael Kastner, Alona Boag, Vitaliy Lomakin, and Jun Hu (Chair of the TPC).



Figure 9. Attendees discussing recent progress in computational electromagnetics during a coffee break (l-r): Prof. Zaiping Nie (General Chair), Prof. Jianming Jin (General co-Chair), Prof. Jiming Song.



Figure 12. The FEM2014 reception dinner: General co-Chair of the FEM2014, Prof. Jianming Jin, and Chair of the TPC, Prof. Jun Hu, at the door of the Maya Café.



Figure 13. (l-r) Profs. B. Shanker, V. Lomakin, and Jun Hu, and Dr. Kezhong Zhao attending the reception dinner held at the Maya Café.



Figure 16. The closing banquet of FEM2014 at De Xing restaurant, on May 16, 2014.



Figure 14. An evening walk in Mt. Qingcheng before dinner, on May 15, 2014: (l-r) Jun Hu, Jianming Jin, Qinghuo Liu, Xinqing Sheng, and Zhen Peng.



Figure 17. The FEM2014 attendees enjoyed a famous Sichuan face-changing show at the closing banquet.



Figure 15. A committee meeting of the FEM workshop. General co-Chair, Prof. Jianming Jin, spoke about FEM2016.



Figure 18. The co-Chair of the TPC, Prof. Lijun Jiang, presented the best student paper award to three students among the ten student winners: (l-r) Wan Luo, Zi He, and Oliver Wiedenmann.

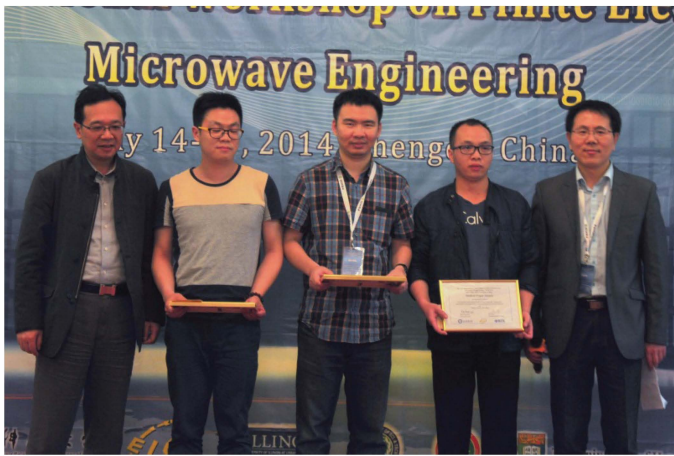


Figure 19. The co-Chair of the TPC, Prof. Xinqing Sheng, presented the best student paper award to three students among ten student winners: (l-r) L. Du, Han Guo, and Ping Li. The other four student winners were Fritz Kretzschmar, Wang Xiang Hua, Bi-Yi Wu, and Jie Zhang, presented by the co-Chair of the TPC, Prof. Rushan Chen.



Figure 20. A gathering of alumni and visiting scholars of UIUC (the first time in China): (l-r) Mei Song Tong, Amir Boag, Alona Boag, Yumao Wu, Dan Jiao, Raphael Kastner, Ruth Kastner, Su Yan, Qinghuo Liu, Ali Yilmaz, Fritz Kretzschmar, Sascha M. Schnepf, Vitaliy Lomakin, B. Shanker, Zaiping Nie, Jianming Jin, Jiming Song, Xinqing Sheng, Sheng Sun, and Lijun Jiang.



Figure 21. The members of the Chinese Computational Electromagnetics Society and international advisory members attending FEM2014: (l-r) Zhengrui Li, Guizhen Lu, David Chen, Xinqing Sheng, Xijun Yu, Rushan Chen, Junhong Wang, Jiming Song, Jianming Jin, Qinghuo Liu, Mingyao Xia, Wenyan Yin, Guoqiang Zhu, Jun Hu, and Lijun Jiang.



Figure 22. The oldest and only surviving no-dam irrigation system in the world, and a wonder in the development of Chinese science.



Figure 23. The Giant Panda Breeding Base: giant pandas are not only a Chinese national treasure, but are also beloved by people all around the world.



Figure 24. Members of the Organizing Committee of FEM2014: (l-r) TPC co-Chair Prof. Rushan Chen, TPC co-Chair Prof. Lijun Jiang, Prof. Qinghuo Liu, General co-Chair Dr. Yun Hua, General Chair Prof. Zaiping Nie, General co-Chair Prof. Jianming Jin, Vice President of the UESTC Prof. Houjun Wang, TPC Chair Prof. Jun Hu, TPC co-Chair Prof. Xinqing Sheng, Dean of the School of Electronic Engineering of the UESTC Prof. Yong Fan.



Figure 25. The General Chair of FEM2014, Prof. Zaiping Nie, presented the recognition certificates to the representatives of three commercial software companies: (l-r) FEKO, CST, and ANSYS.

We had a completely full room for discussions (Figures 7 and 8), which turned out to be extremely useful and engaging. The attendees especially enjoyed one-on-one discussions during coffee breaks (Figure 9) and social events, visiting DuJiang Dam and Panda Base.

It is a great tradition of the International FEM Workshops to provide a rich social program for the delegates. The program prepared by the FEM2014 Local Organizing Committee started with a welcome reception on the evening of May 14, 2014. Many workshop participants enjoyed delicious but spicy Sichuan food, while meeting with new and old friends.

In the afternoon of May 16, 2014, the FEM Workshop Committee held a meeting to discuss the next FEM workshop. It was decided that FEM2016 will be held in beautiful Florence, Italy.

The FEM2014 closing banquet on the evening of May 16, 2014, featured a unique Chinese experience: a Sichuan cuisine dinner with a face-changing show in Sichuan opera and folk performances, at De Xing Restaurant (Figures 16 and 17). The Vice President of UESTC, Prof. Houjun Wang, delivered a warm welcoming speech.

Following a new program introduced by FEM2012, the FEM2014 awarded ten best Student Paper Prizes, which were sponsored by Science Park of UESTC. The student awardees, coming from several countries, presented their winning papers at the workshop, and were recognized at the conference banquet (Figures 18 and 19).

Besides academic exchange and technical discussion, FEM2014 also provided an excellent opportunity for the gathering of different organizations and communities. Many attendees enjoyed meeting with friends in their community (Figures 20 and 21).

The highlight of the social program was the one-day tour after the conference. Because of the great interest, two routes were arranged for the tour on May 17, 2014. One route was to visit Dujiangyan, the oldest and only surviving no-dam irrigation system in the world (Figure 22), and Jiezi Ancient Town. The other route was to visit the Giant Panda Breeding Base to see the Chinese national treasure (Figure 23). Visitors also walked into the Wide and Narrow Lanes to feel the most local and ancient, yet international and stylish part of Chengdu city. More details on these scenes can be found at the Web site of the workshop: <http://www.fem2014.org/Nclass.asp>.

On behalf of all FEM2014 authors and participants, we would like to thank Prof. Jianming Jin, whose help and support to the FEM2014 Organizing Committee (Figure 24) were essential in all stages of the preparation and running of the workshop. Special thanks go to NSFC (National Science Foundation of China) for the great financial support. Three leading commercial software companies, ANSYS (ANSOFT), CST (Computer Simulation Technology), and EM Software & Systems SA (Pty.) Ltd. (FEKO), also provided financial support for the FEM2014, and they were recognized at the awards ceremony (Figure 25).

It was our great pleasure to be of service to the FEM and computational electromagnetics communities, to lead the organization of FEM2014, and to host so many researchers and colleagues in Mount Qingcheng. We hope to see you all and many others at our next workshop, FEM2016, to be held in Florence, Italy.

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