

FOREWORD

The world is increasingly intelligent and connected through the ubiquitous functioning of various sensors and transmission systems based on the generation and propagation of acoustic waves in piezoelectric solids, as so many researchers and engineers are working on the analysis, design, manufacture, test, and applications of piezoelectric acoustic wave devices. The evidence, of course, is the growing participation and scope of the *Symposium on Piezoelectricity, Acoustic Waves, and Device Applications (SPAWDA)* started in Ningbo University, 2004, and followed in Zhejiang University, 2006.

This volume is the outcome of the Second Symposium on Piezoelectricity, Acoustic Waves, and Device Applications (SPAWDA 2006) held at Zhejiang University, Hangzhou, China, December 14-17. The Symposium was sponsored by major organizations including the Chinese Society of Theoretical and Applied Mechanics (CSTAM), the Acoustical Society of China (ASC), and the IEEE UFFC Society and organized by Zhejiang University and Ningbo University with the participation of about 140 leading scientists, engineers, industrial experts, and students representing prominent institutions and special interest groups in countries and regions such as China, US, Germany, Saudi Arabia, Hong Kong, and Taiwan. The subjects and topics of the Symposium, as readers can discover from papers in this collection, are broad, in-depth, and comprehensive in major areas concerning the frontiers and emerging technology of piezoelectric acoustic wave devices in three major aspects: fundamental theory, devices, and applications.

The majority of presentations and papers are delivered by Chinese authors, but the international participation has blended the Symposium and this volume of proceedings to the ideal flavor. We hope that this proceeding will serve not only as an overview of the current knowledge and technology about the theory and practical methods, but also as a catalyst and guide for future research in this rapidly growing field of piezoelectric devices and applications. We look forward to the development and practical applications of new theories, methods, and technologies, and foresee an increasing reliance on research and development through forged partnerships among academic, governmental, and industrial institutions.

The opening address by Professor Wei Yang, Academician of the Chinese Academy of Sciences and President of Zhejiang University, has praised the efforts in bringing researchers in Mechanics and Material Science and engineers in device development and applications to this unified forum for the opportunity to present and learn the latest discoveries, findings, and developments on major aspects of the theory, tools, and products in this exciting and growing industry. Professor Yang showed his encouragement and support to researchers in Mechanics for their contribution. Representatives from professional organizations and industries were also showing their supports as before with praises, encouragements, and expectations for the success of the Symposium. Throughout the event, speakers have been emphasizing applications of Mechanics, Physics, and Material Science in the development of piezoelectric acoustic wave devices as guiding principles, design tools, and enabling technology. Significantly, the panel discussion on piezoelectric device technology led by industrial experts like Dr. CS Lam (TXC), Dr. Clemens Ruppel (Epcos), Mr. Zhonghua Xie (Huapu), Mr. Xiaobing Chen (26th Institute), and others was well received in updating the latest technology trend in the industry and foreseeing challenges ahead by relating the basic science and research to current industrial needs.

There were more varieties in technical programs this year. In addition to the general sessions and 14 parallel sessions, there was a *Tiersten Memorial Session* dedicated to Professor Harry F. Tiersten, who has been a leading researcher in the field and passed away on June 12, 2006. Professor Tiersten has made important contributions to the field of piezoelectric devices and his book entitled *Linear Piezoelectric Plate Vibrations* is also a standard reference among researchers and students. There were also three sessions for the student paper competition with winners of best paper awards selected by groups of judges. In a brief closing ceremony, a few industrial and academic leaders handed out Student Paper Awards to the winners. It is hoped that the students will be encouraged to study and work in this friendly and close community. Of course, it is our honor to express our gratitude and appreciation to our

industrial sponsors: *TXC Corporation* (<http://www.txc.com>), *Huapu Microelectronics* (<http://www.cetmc.cn>), *East Crystal* (<http://www.ecec.com.cn>), *Vectron Shanghai* (www.vectron.com), and *Changfeng SAW Technology* (<http://cssaw.com>).

In summary, successful outcomes of this Symposium include: 1) enhanced technical exchange with involvements of academia, government labs, and industrial engineers and management; 2) extended interaction between theoretical study and product development, especially the invitation from Mr. Zhonghua Xie on visiting his research and production facility and free fabrication service for academic research are the important steps towards further academic and industrial cooperation; 3) enriched experiences for students with both student paper competition and opportunities from industries for practical training and employment; and 4) expanded international participation through the sponsorship by the IEEE UFFC and publication by the World Scientific.

As the Symposium is highly supported by colleagues, friends, participants, and sponsors, a more exciting event is to be seen at the Third Symposium on Piezoelectricity, Acoustic Waves, and Device Applications (Spawda 2008) to be held in Nanjing and organized jointly by Nanjing University of Aeronautics and Astronautics and Nanjing University in 2008.



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