

Report

The International Conference on Advanced Optical Diagnostics in Fluids, Solids and Combustion (VSJ-SPIE04)

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Abstract: The International Conference on Advanced Optical Diagnostics in Fluids, Solids and Combustion (VSJ-SPIE04) was successfully held in Tokyo from December 4th to 7th in 2004 under the co-sponsorship of Visualization Society of Japan (VSJ) and The International Society for Optical Engineering (SPIE). Total 66 papers on forefront optical diagnostics and those applications were presented at the conference and the active and enthusiastic discussions were made. The results of the conference surely contribute to the future developments of optical diagnostics in the wide engineering fields.

Keywords: Optical Diagnostics, Flow Visualization.

1. Introduction

The International Conference on Advanced Optical Diagnostics in Fluids, Solids and Combustion (VSJ-SPIE04) was successfully held from 4th to 7th of December 2004 at Sanjo Conference Hall in the campus of the University of Tokyo as the second joint conference of Visualization Society of Japan (VSJ) and The International Society for Optical Engineering (SPIE). This conference was the succession to the International Conference on Optical Technology and Image Processing in Fluids, Thermal and Combustion Flow (VSJ-SPIE98) held fruitfully at Yokohama Symposia in 1998 as the first joint conference of VSJ and SPIE.

The conference aimed at providing an opportunity for engineers and scientists to present and discuss the state of the art on “advanced optical diagnostics in fluids, solids and combustion” both in applications and technologies. Conference topics for sessions included, but were not limited to, the followings.

Conference Topics

Applications

- * Micro/nano metrology and optical systems
- * Surface measurements for temperature, heat transfer, strain, and deformation in solids
- * Fluid measurements for velocity, temperature, pressure, density, and visualization
- * Combustion diagnostics, including species, particles, fluid/chemical kinetics and sprays

- * Optical methods for remote detection of chemical species
- * Non-destructive evaluation of structures

Technologies

- * Integrated optics, distributed optics, quantum optics, fiber optics
- * Interferometry, photogrammetry, liquid crystals techniques, infra-red sensing
- * Scattering, spectroscopy, laser induced fluorescence, molecular tagging, laser trapping
- * Schlieren, speckle metrology, holography, moire, shearography
- * PIV, holographic PIV, global Doppler velocimetry
- * Tomography, neural networks, fuzzy logic, instrument integration
- * Data processing, data integration, calibration, and error analysis

The conference provided a forum for researchers and practitioners to communicate and exchange information in the field of optical diagnostics and visualization applied over a wide range of disciplines which utilizes this technique such as, fluid dynamics, solid mechanics, combustion engineering and many others. And the local organizing committee decided to hold this conference within limited size in order to realize substantial discussions, on the other hand, to have enough number of keynote lectures on latest topics by outstanding speakers. Fortunately, we had 6 keynote lectures by distinguished researchers in the field of fluid, solid and combustion. In the oral sessions, 54 excellent papers were presented, and 10 papers were presented at the poster session. The total number of participants from 13 countries of all over the world was 101. The exhibition was held simultaneously with 4 exhibitors of optical devices and measuring instruments.

2. Conference Program

2.1 Opening Ceremony

The Opening Ceremony of the International Conference on Advanced Optical Diagnostics in Fluids, Solids and Combustion (VSJ-SPIE04) was held in the morning of December 4th, 2004 after the chairperson of Prof. Okamoto who was the Secretary General of the conference. On behalf of the Visualization Society of Japan as host organization, Prof. Mizuno, the vice president of VSJ, gave a welcome address for all participants. Prof. Kawahashi, the chair of the Organizing Committee, delivered an opening address and then formally opened the VSJ-SPIE04.

After the Opening Ceremony, the first Keynote Lecture was delivered by Prof. Yoda as a plenary session. The details of all the Keynote Lectures are given in the following.

2.2 Keynote Lecture and Technical Sessions

The organizing committee selected 6 distinguished persons from Asia, USA and Europe as invited keynote speakers at the conference in the fields of fluid dynamics, solid mechanics and combustion engineering. The keynote speakers and the titles of keynote lectures were as follows:

Invited Keynote Lectures

- * Prof. Hans Tiziani (University Stuttgart, Germany), "High resolution optical topometry –state of the art and future development"



Fig. 1. Opening address by the conference chair.

* Prof. Satoru Toyooka (Saitama University, Japan), “Spatio-temporal analysis of inhomogeneous deformation processes by dynamic ESPI”

* Prof. Minami Yoda (Georgia Institute of Technology, USA), “Applications of nano-particle image velocimetry (nPIV) for measuring near-wall velocity fields with submicron spatial resolution”

* Prof. Jerry Westerweel (Delft University of Technology, Netherlands), “Investigation of the turbulent/non-turbulent interface using combined PIV/LIF”

* Prof. Patrick V. Farrell (University of Wisconsin-Madison, USA), “New approaches for dense spray imaging”

* Prof. Masashi Katsuki (Osaka University, Japan), “Visualization and diagnostics in spray flames”

Those keynote lectures were very much interesting and exciting for scientists and engineers in the field of optical diagnostics, and I believe that all participants have been motivated to development in their future work by the lectures.

In the general sessions, 53 papers covered broad range of topics in optical diagnostics were presented. There were 15 technical sessions as follows:

Micro PIV, Time-Resolved PIV, Advanced PIV, PIV Measurement
 Turbulent Flow, High-Speed Flow
 Temperature Measurement, Scalar Measurement
 Surface Measurement, Solid Measurement
 Interferometry, 3-D Measurement
 Flame, Spray, Combustion Diagnostics

And 10 papers were presented at poster session. All the keynote lectures and the presented papers are published in the Proceedings of the International Conference on Advanced Optical Diagnostics in Fluids, Solids and Combustion in the form of CD-ROM (ISBN4: 906497-83-7).

2.3 Social Programs

Registration desk opened at the conference site (Sanjo Kaikan) on December 3rd and a welcome party was held in the evening in the day. International Program Committee meeting was held in the evening of December 4th and the official welcome reception for the all participants was held in the



Fig. 2. Keynote lecture by Prof. Yoda.

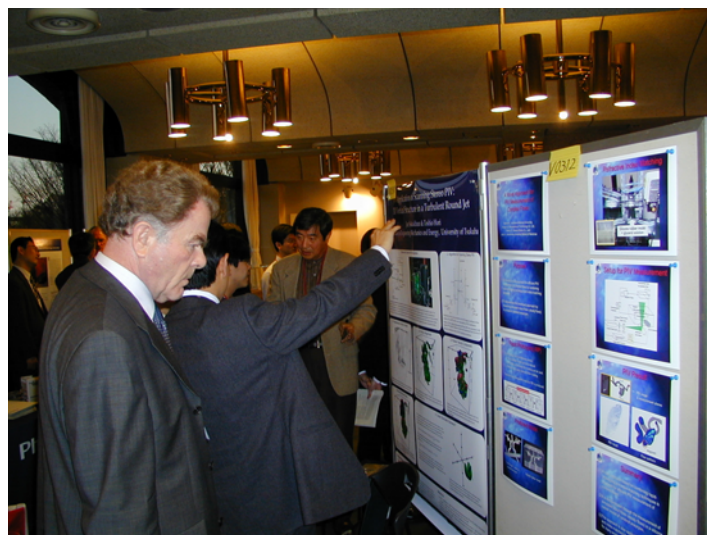


Fig. 3. Poster session.

evening of December 5th at a reception hall in Sanjo Kaikan. At the reception, Prof. Farrell, who is the chair of Optical Diagnostics Group of SPIE, delivered a short address and announced the next conference on optical diagnostics as a part of SPIE's International Symposium on Optics and Photonics which will be held in 2005 in San Diego, USA.

After completion of all technical sessions on December 6th, Prof. Nishino, who was the chair of Program Committee, summarized the conference at the closing. In his summary, the fruitful results of the conference were described by referring the contents of keynote lectures and presented papers.



Fig. 4. Reception.

Acknowledgement

I would like to take an opportunity to express my sincere appreciation to conference co-chairs, Prof. Yoshizawa, Prof. Farrell and Dr. Mercer, and the local organizing committee members, Prof. Okamoto, Prof. Nishino, Prof. Sakakibara, Prof. Nishio and Prof. Hirahara, for their efforts to the success of the conference, especially to Prof. Okamoto serving as Secretary General and to Prof. Nishino serving as Chair of Program Committee. I would like to express my thanks to the exhibitors for their support. And also I have to express my sincere thanks to Ms. Yamashita for her great contribution to the conference.

Author Profile



Masaaki Kawahashi: He received his MSc (Eng) degree in mechanical engineering in 1968 from University of Electro-Communication (UEC), and his PhD (Eng) from The University of Tokyo in 1978. After graduating from UEC, he joined at Saitama University as a Research Associate. His current position is a Professor of Fluid Dynamics in Department of Mechanical Engineering, Saitama University. His research subjects are finite amplitude wave motion, development of acoustic compressor, PIV applications to centrifugal fan, and analysis of oscillatory air flow in bronchial model by using micro-PIV.