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Optical Measurement Systems for Industrial Inspection VIII

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Editors

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Introduction

In 2013, optical metrology systems are well-established and do their job reliably in many fields of industrial inspection. Most measurement systems are based on similar sets of optical standard components. The basics of optical measurement techniques are widely understood and the limitations of optical principles are generally well-known.

So, why is a conference on "Optical Measurement Systems for Industrial Inspection" really needed? The answer is that there are still enough measurement problems to be solved and often optical metrology provides the only promising solutions. Industrial production processes are gaining complexity, precision and speed. Industrial products are becoming continuously more demanding. They require higher and higher accuracy in all three dimensions. At the same time, measuring speed should be increased and measurement systems come closer to production. These demands steadily stimulate the search for new or improved measurement methods, strategies and configurations. Novel components help researchers to meet these industrial requirements. In addition, powerful software tools, e.g. optics design and simulation software, enable to understand, layout, and optimize complex optical systems.

Therefore, the Munich conference still represents an important international forum of scientific exchange and discussion. More than 150 submissions show that the Munich conference series, which was established more than 12 years ago, is a considerable event for researchers working in the field of optical metrology all over the world. With more than 70 oral presentations and more than 60 posters, the 2013 conference could hold the high number and outstanding level of contributions, which made it as successful as it is.

Traditionally, a large number of contributions address optical measurement of three-dimensional geometrical features. The methods focus on both, coherent techniques such as holography and interferometry, as well as incoherent methods like structured light, confocal techniques, or deflectometry.

Since the measuring objects reach from the micrometer or even sub-micrometer range to dimensions of several meters, in this year's conference, there are sessions on large scale objects on the one hand, on light scattering techniques and line-width measurements dealing with smallest structures on the other. A field of application, which still remains in the focus of the conference, is the measurement of optical components, e.g. aspheres, free-form surfaces, and optical systems. And not only here, but in general, it is a basic concern of the conference since its beginnings to address those techniques that go beyond the limits of current optical instruments.

Since it is the people who move things forward, we would like to thank those who supported this conference.

First, we would like to express our sincere gratitude to the program committee for their support in the run-up of the conference. We also thank all authors, especially the distinguished invited speakers: Ibrahim Abdulhalim (Ben-Gurion Univ. of the Negev, Israel), Gerd Häusler (Friedrich-Alexander-Univ. Erlangen-Nürnberg, Germany) and Angela Duparré (Fraunhofer-Institut für Angewandte Optik und Feinmechanik, Jena, Germany) for their stimulating lectures on "Low coherence full field interference microscopy or optical coherence tomography: recent advances, limitations and future trends" (I. Abdulhalim), "Deflectometry vs. interferometry" (G. Häusler) and "Light scattering techniques for efficient surface quality control" (A. Duparré).

Finally, many thanks are due to the SPIE staff for their excellent and cooperative work during the conference organization and the preparation of these proceedings. Thanks are also due to all authors, who not only fill the conference with life, but also give added value to this proceedings volume.

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