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CONGRESS OF METROLOGY 2007 Cracow, 9–13. September 2007

From 9 to 13 September 2007, at the AGH University of Science and Technology, there took place the undoubtedly most important metrological conference, i.e. The Congress of Metrology '2007. Metrological congresses are held every three years. After consecutive congresses, organized by Prof. Romuald Zielonko at the Technical University of Gdańsk (1998), by Prof. Ryszard Jachowicz at the Technical University of Warsaw (2001) and by Prof. Janusz Mroczka at the Technical University of Wrocław (2004), the present one, organized by the Department of Metrology at Stanisław Staszic AGH University of Science and Technology, took place in Cracow. The organization of the Congress of Metrology harmonized well with the celebration of the 55th anniversary of the Faculty of Electrical Engineering, Automatics, Computer Science and Electronics and the Golden Jubilee of the Department of Metrology.

The Congress of Metrology 2007 was held under the auspices of the Committee of Metrology and Scientific Apparatus of the Polish Academy of Sciences, together with the Chairman of the Head Office of Measures. The Honorary Committee included Prof. **Antoni Tajduś**, Rector of the AGH University of Science and Technology (Chairman of the Committee), Colonel **Stanisław Dąbrowski**, Director of the Military Centre of Metrology of the Ministry of National Defence, Prof. **Janusz Kowal**, Dean of the Faculty of Material Engineering and Robotics at the AGH University of Science and Technology, Prof. **Krzysztof Jan Kurzydłowski**, Junior Minister at the Ministry of Science and Higher Education, Prof. **Jacek Majchrowski**, Mayor of the City of Cracow, **Janina Maria Popowska**, President of the Head Office of Measures, Prof. **Tomasz Staszekiewicz**, Head of the Faculty of Metrology at the AGH University of Science and Technology in the years 1957–1983, Prof. **Tomasz Szmuc**, Dean of the Faculty of Electrical Engineering, Automatics, Computer Science and Electronics at the AGH University of Science and Technology and Chairman of the Committee of Metrology and Scientific Apparatus of the Polish Academy of Sciences, Prof. **Janusz Mroczka**.

Through the motto of the Congress, '**Metrology – a tool to cognition and the way to development**' and the subject matter of the congress papers, we tried to particularly emphasize the following matters: new trends in the development of metrology, new tools of studying the measured processes, objects and signals as well as new areas for the application of metrology. The organizers intended the novelty, the interdisciplinary character and the originality of the subject matter to be the main distinguishing features of the research work published in the Congress papers, after thorough reviews and presentation during the proceedings.

Altogether, around 270 reviews and 220 full papers were sent to the Congress of Metrology 2007. The considerable majority of them were of high content-related value. Each paper submitted to the Congress was reviewed by two recognized specialists in the field of metrology, members of the Scientific Committee of the Congress. The Scientific Committee worked under the supervision of Prof. Michał Szypera (AGH). It included 56 Professors working in various academic centres and institutes. They produced over 500 reviews, significantly contributing to the high content-related level of the Congress.



Photo 1. The participants of the Congress of Metrology 2007 during the opening ceremony, 10 September 2007, AGH Hall, Cracow.

As the result, 192 papers were included in the Congress agenda. Thanks to kind co-operation of the Editor, Prof. **Tadeusz Skubis**, the papers were published in two volumes of the book *9bis/2007* of the scientific-technical monthly *Measures Automatics Control*, which will allow a greater public, interested in the subject matter of metrology, to get acquainted with them. At the same time, the intention of publishing the work in a periodical imposed even stricter criteria of assessment of the papers sent.

The main purposes of the organisation of the Congress were the presentation of results of our latest research work, a roundup of the trends in contemporary metrology

and a content-related discussion. The Congress is a countrywide meeting of the metrologists working at universities, research institutes and industry. It is therefore a great opportunity to exchange ideas, review new research lines and new trends in metrology, to present to a greater public the research work done by young scientists preparing their dissertations for successive scientific degrees. Such meeting is also an opportunity to make new acquaintances and friendships, often resulting in undertaking scientific co-operation in research projects.

The subject matter of this year's Congress of Metrology covered three basic areas and several more detailed thematic groups. The scientific papers presented under the heading '**Contemporary problems of metrology**' concerned:

- measurement microsystems, equipment and project issues, new technologies,
- distracted and wireless systems, interfaces and protocols, compression and data transfer,
- measurement data fusion, identification of models of complex processes and objects,
- methods and algorithms of data analysis,
- new problems connected with processing a/c; speed and resolution limits,
- sensors and converters with light modulation, electrochemical sensors, etc.

Another area was '**New measurement methods and their application**'. The presentations under that heading were connected with the following, detailed issues:

- biomedical measurement, methods of diagnostics and medical analysis,
- measurement of conventional and unconventional sources and energy converters,
- technological and transport measurement, "intelligent" objects,
- environmental measurement, emergency recognition,
- measurement and diagnostics of mechanical objects, acoustic measurement,
- measurement in military application.

The third thematic group covered during the Congress of Metrology '2007 concerned "**Contemporary problems of the rudiments of metrology and the didactics of metrology**". Under that heading the following issues were discussed:

- theory and modelling of measurement systems,
- standards and relation values, precise measurement, modelling and legal metrology,
- quantum measurement, quantum standards,
- errors, unreliability, sensitivity,
- didactics of metrology, syllabuses, new contents of coursebooks.

Apart from the papers submitted by the participants of the Congress, on the agenda there were also three plenary lectures by the invited guests. Prof. Gerard Meiler of the Technical University DELFT, Holland, delivered a lecture on 'Universal Asynchronous Sensor Interfaces'. Prof. Eugeniusz Ratajczyk of the Technical University of Warsaw delivered a lecture on 'Advanced Coordination Measurement in Production Technology'. The third lecture was given by Prof. Martin Burghof of the Physikalisch – Technische Bundesanstalt, Berlin. The title of the lecture was 'Nuclear Magnetic Precession Measured with SQUID'.

The programme of the Congress included both theoretical and constructive works, aimed at the development of metrology (the first group), developing new measurement tools of higher definition and greater working speed, working out new, more efficient algorithms of measurement data processing. Another group consisted of application works, concerned with the application of metrology in various areas of our life. The third group included works which are traditionally regarded as the theory of measurement and works connected with the education of new specialists in the field of metrology.

The level of interest in particular thematic groups is somewhat illustrated by the number of submitted papers. The most numerous group includes works connected with the field of mechanical measurement (30 papers), measurement in medicine (20 papers), optical and fibre-optic measurement (18 papers), transmission and signal processing (16 papers), modelling and research on simulation measurement systems and their components (14 papers), errors, unreliability of measurement and standards (12 works) and apparatus and measurement systems (12 papers).

The variety of the submitted papers and the titles of the lectures given, reflect well how broad the thematic area constituting the subject of interest of metrology is.

In my opinion the works accepted for the Congress and published in the periodical are of high substantive level and produce a representative picture of the contemporary metrology.

The sessions of the Congress were accompanied by meetings of the working groups and opinion-forming bodies working in metrological circles. There also took place a meeting of the Committee of Metrology and Scientific Apparatus of the Polish Academy of Sciences. The Chairman of the Committee is Prof. **Janusz Mroczka** of the Technical University of Warsaw. The purpose of the meeting was above all the election of deputy-chairmen of the Committee of Metrology and the Academy of Sciences, the appointment of working sections and the election of their chairmen:

- the Section of Apparatus and Measurement Systems (Chairman Prof. **Janusz Gajda**, AGH),
- the Section of Quality Engineering and Diagnostics (Chairman Prof. **Stanisław Adamczak**, the Technical University of Kielce),
- the Section of Microsystems and Measurement Sensors (Chairman Prof. **Ryszard Jachowicz**, the Technical University of Warsaw),
- the Section of the Rudiments of Metrology (Chairman Prof. **Stefan Kubisa**, the Technical University of Szczecin).

There also took place a meeting of the international consortium of the TEM-PUS programme. Its purpose was to summarize the current results of the project **JEP N*19010-2004 “INTRODUCING TWO-TIER STUDIES IN THE FIELD OF METROLOGY”**. It was attended by the representatives from Holland, Macedonia and Poland. During the meeting D. Sc. **Marek Stencel** presented a multimedia presentation *Wireless Sensor Networks*.



Photo 2. Members of the Committee of Metrology and Scientific Apparatus of the Polish Academy of Sciences in the years 2007–2011, present at the session on 15 September 2007, Cracow. The first row on the left: Prof. Romuald Zielonko – Editor of the quarterly “Metrology and Measurement Systems”, Prof. Remigiusz Rak, Deputy Chairman of the Committee, Prof. Eugeniusz Ratajczyk, Honorary Chairman of the Committee, Prof. Janusz Mroczka, Chairman of the Committee, Prof. Janusz Gajda, Deputy Chairman of the Committee, Prof. Anna Domańska.

The Organisational Committee of the Congress of Metrology ‘2007, working under the supervision of D. Sc. **Ryszard Sroka** provided the participants with an opportunity to relax after numerous hours and days of intensive sessions. The opening banquet held on the first night of the Congress undoubtedly served that purpose. There also took place a session called “The Night of the AGH – UST Traditions”, in which we wanted to take advantage of the presence of such numerous and renowned audience and present to them the rich tradition of our University. In 2009 the AGH University of Science and Technology will celebrate its 90th anniversary. Therefore, the information presented was quite substantial.

On the third night the participants had the pleasure of watching the performance of the student folk group “Krakus”.

Here, on behalf of the organizers, I would like to thank the members of the Scientific Committee for their attention to the high substantive level of the papers presented in the sessions of the Congress, the authors of the papers for their effort undertaken in their preparation, the authors of the lectures for accepting the invitation and their effort, and all members for their participation in the sessions of the Congress and the discussion held in the friendly atmosphere.