NEWSLETTER

IMEKO Technical Committee 12

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Dear Colleagues,

welcome to the usual appointment with the TC12 newsletter. Since the previous issue came in September 2010, we are now recovering time, in order to position the semi-annual newsletter publication in December/January and June/July, depending on the news content.

This issue brings you several news regarding TC12 activities and, more in general, some thermal metrology news.

The **TEMPMEKO-ISHM papers** review and publication activity is proceeding well. A short report from the Editors regarding the status of the review process and submitted papers is reported in the following article.

The Euramet **EMRP** joint research projects 2010 call is closed and the list of funded JRPs is now official. The new 2011 call on the Targeted Programs of "New Technologies", "Health" and "SI Broader scope" is not jet open, but first ideas on the matter have started to circulate in the community.

During 2010 the CCT submitted three relevant two **recommendations to CIPM**, regarding its mission, the need of traceability for climate change monitoring and the new definition of the unit of temperature and its *mise en pratique*.

The year 2011 is expected to be a relevant one for temperature: the iMERA+Boltzmann's project will end and the experiment aiming at giving a weighted value of the kB for the **new definition of the kelvin** will have to meet the 2012 deadline. New experiments will start on a wider idea of the temperature scale, including the thermodynamic dissemination of the unit and new and different ways for its *mise en pratique*.

New activities and collaborations will start under the EURAMET EMRP, in the fields of Environment and Industry, also involving collaborations from countries outside Europe.

Temperature metrologists will be busy (as usual, but even more!) in all these relevant aspects of science.

Andrea Merlone

Joint International Symposium on Temperature, Humidity, Moisture and Thermal Measurements in Industry and Science

May 31st - June 4th 2010
Portorož, Slovenia
www.tempmeko-ishm.org

Over the four days of the conference, the participants presented a total of 349 contributions. The first special issue of International Journal of Thermophysics has been published (Volume 31, Issues 8-9, dated September 2010) and contains 46 peer-reviewed contributions. Other submissions have been accepted in the meantime and will appear in one of the next issues. In total 3 to 4 special issues are envisaged for the field temperature and thermal measurements and one for the field humidity and moisture. As can be seen from the table below, a fraction of papers is still under review and it is hoped that the reviewers can complete their work in due time. Only a very small number of authors have asked for a late submission and are still working on their contributions.

T: Temperature and Thermal Measurements

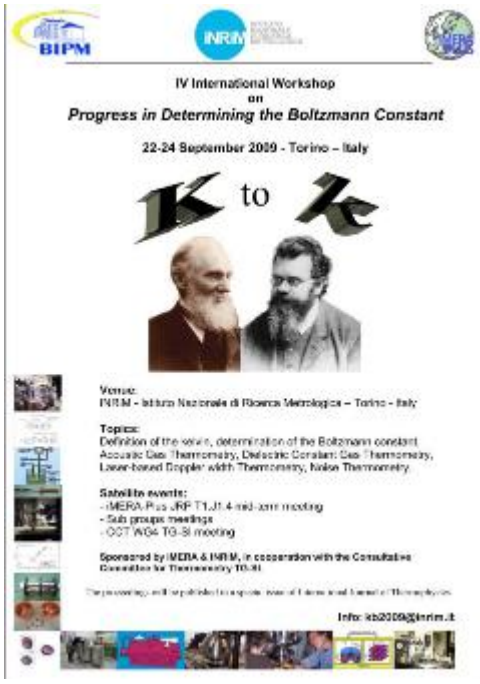
H: Humidity and Moisture

	T	**H**
Total number of submitted papers:	211	56
Revised papers accepted for publication	59	3
Revised papers in the final stages of the editorial process	17	8
Reviewed papers under revision	36	18
Papers under review	76	19
Papers to be allocated to reviewers	10	5
Rejected or withdrawn papers	13	3

Joachim Fisher
Jeremy Lovell-Smith

IV International Workshop on determining the Boltzmann constant.

IJT proceeding special issue published



The special issue of International Journal of Thermophysics on the *IV International Workshop on determining the Boltzmann constant* has been published. It contains 12 papers on the advances of several experiments regarding the different

measurements methods, including Acoustic Gas Thermometry, Dielectric Constant Gas Thermometry, Doppler Broadening Thermometry and Noise Thermometry. The issue opens with a historical introduction on the life of Boltzmann describing the science in his age and the deep meaning of his studies with respect to the proposed new definition of the kelvin.

EMRP 2010 call on the Targeted Program "Environment" and "Industry" closed.

On November 22nd, 2010 the EMRP review conference took place in Budapest. An international board of referees evaluated the proposed JRPs on the subjects of Environment and Industry. The JRP coordinators met the referees during two days sessions, including a questions and answers session and a JRP poster presentation. From the resulting ranking list, 9 of the 17 projects presented for the Targeted Program environment succeeded in being funded and 17 over 22 for the Industry. The negotiation process of the projects is starting: the JRPs are supposed to start in mid 2011 and last for 36 months. New activities, new cooperation agreements, new tasks and consequent deliverables will be the subject of the work for many temperature and humidity metrologists in the next years. The titles of the JRPs are challenging and they will surely give a help in improving the knowledge of climate changes and indicators and will provide significant contributions to the improvement of industrial processes.

A list of the approved projects is presented in the following tables.

TP Environment
Metrology for chemical pollutants in air
Emerging requirements for measuring pollutants from automotive exhaust emissions
Traceability for surface spectral solar ultraviolet Radiation
Traceable radiometry for remote measurement of climate parameters
Metrology for oceanic salinity and acidification
Spectral reference data for atmospheric monitoring
Metrology for pressure, temperature, humidity and airspeed in the atmosphere
Traceable measurements for monitoring critical pollutants under the European Water Framework Directive (WFD-2000/60/EC)
Metrology for radioactive waste management

TP Industry
High temperature metrology for industrial applications (>1000 °C)
Electromagnetic characterization of materials for industrial applications up to microwave frequencies
High pressure metrology for industrial applications
Ionizing radiation metrology for metallurgical industry
Dynamic mechanical properties and long-term deformation behavior of viscous materials
Metrology for industrial quantum communication technologies
Metrology for the manufacturing of thin films
Metrology for advanced industrial magnetics
Traceable dynamic measurement of mechanical quantities
Optical and tactile metrology for absolute form characterization
Metrology to assess the durability and function of engineered surfaces
Vacuum metrology for production environments
Thermal design and time-dependent dimensional drift behavior of sensors, materials and structures
New generation of frequency standards for industry
Traceable quantitative surface chemical analysis for industrial applications
Metrology for ultra-fast electronics and high-speed communications
Metrology of small structures for the manufacturing of electronic and optical devices

CCT recommendations to CIPM.

During the XXV meeting of the, Comité Consultatif de Thermométrie (CCT) in 2010, two relevant recommendations to CIPM have been approved, beside an additional one on the general mission of the CCT itself.

The two recommendations can be seen as a further confirmation that the main subjects for the metrologists involved in thermodynamic (temperature, humidity) measurements are the new definition of the unit, the kelvin, and the environmental and climate studies.

RECOMMENDATION T 2 (2010),

Considerations for a new definition of the kelvin,

states that the CCT, noting that various experiments, such as acoustic gas thermometry, dielectric constant gas thermometry, Johnson noise thermometry, total radiation thermometry and Doppler broadening thermometry represent distinct routes to determining the Boltzmann constant, recommends that before proceeding with the redefinition of the kelvin a relative standard uncertainty of the value of k of the order of one part in 10^6 be obtained, based on measurements obtained by at least two of those different methods of primary thermometry, and corroborated by the others.

On the subject of metrology for climate studies, the CCT, with its

RECOMMENDATION T 3 (2010),

on climate and meteorological observations measurements

considering that

- global average temperature records are essential in understanding how the climate is changing;
- the consequences of these changes have deep impacts on different aspects of social, political and economic life;
- the need exists to improve the quality of data collection by assuring worldwide traceability in measurements involved in climate studies and meteorological observations, as expressed by climate-data users and during the recent WMO-BIPM joint workshop on “Measurement Challenges for Global Observation Systems for Climate Change Monitoring: Traceability, Stability and Uncertainty " (Geneva March 2010);
- the signing of the MRA by WMO will lead to closer liaison and cooperation with the thermal metrology community;
- research and coordinated analysis is required to build up a worldwide network supplying traceable baseline data sets, needed to develop more accurate models for climate change;

recommends the CIPM

- to encourage NMIs and the scientific community, especially temperature metrologists, to be prepared to face new perspectives, needs, projects and activities related to the traceability, quality assurance, calibration procedures and definitions for those quantities involved in the climate studies and meteorological observations;
- to support a strong cooperation between NMIs and Meteorological Institutions at local, national and international levels;
- to encourage NMIs to work with the relevant meteorological networks to support a monitoring framework for traceable climate data over long temporal terms and wide spatial scales based on best practice metrology.