

Focus Topic

Metrology for Environment

Latest News

 **Take part in EU consultation on metrology research**

The European Commission has launched a public consultation on the joint programming of metrology research.

The survey is about EURAMET's European Metrology Research Programme (EMRP) and the European Metrology Programme for Innovation and Research (EMPIR). The EURAMET Chairpersons would like to encourage the EURAMET and broader metrology communities and their stakeholders to take part in the public consultation.

Read more on page 8 in this newsletter.

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SHAPING THE FUTURE OF METROLOGY IN EUROPE FOREWORD FROM EURAMET CHAIRPERSON DR BEAT JECKELMANN



EURAMET's main annual event regarding strategy and development for the future of the organisation took place a few weeks ago: the 10th General Assembly. The event was successfully hosted by our Norwegian member Justervesenet and we had a week full of productive meetings.

One of the changes discussed affects the position of EURAMET's Vice-Chairperson (GA). I would like to welcome Maria Luisa Rastello, who was elected to this post during the General Assembly. At the same time, I would like to express EURAMET's sincerest thanks to Janko Drnovšek, who held the position as Vice-Chairperson (GA) from 2010 to 2016.

The protection of the environment is one of Europe's grand challenges which impact on our future. The joint research projects of the first environment theme of the EMRP are completed. The comprehensive report on the 'Metrology for Environment' projects will be published shortly. Therefore, this newsletter edition focusses on metrology for environment, including an interview with Andrea Merlone, Convenor of the EURAMET Task Group for Environment.

While the report highlights achievements of already completed projects, the 2016 EMPIR Call is looking for future projects focussing again on the energy and environment themes. Stage 2 is open until 30 September 2016 for applications.

To evaluate the current European Metrology Programmes, EMRP and EMPIR, and check support for a possible future programme, the European Commission has launched a public consultation. In the survey participants can provide their view on the current status of the European metrology research system and the challenges it is facing.

To contribute to shaping the future of metrology in Europe I would like to encourage all our stakeholders to take part in the public consultation and provide their opinions.

We hope you enjoy reading Issue 11 of our Newsletter and we wish you an enjoyable summer.

SAVE THE DATE – 11TH EURAMET GENERAL ASSEMBLY IN 2017

The location for EURAMET's 11th General Assembly – in EURAMET's anniversary year – will be the city of Madrid in Spain. The event will take place on 15 to 19 May 2017 and will be hosted by CEM, the Spanish National Metrology Institute. Further information will be available end of the year.



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EVENTS

INTER.NOISE 2016

21 to 24 August 2016
Hamburg, Germany
<http://www.internoise2016.org/>

4th CIE Expert Symposium on Colour and Visual Appearance

05 to 07 September 2016
Prague, Czech Republic
http://div2.cie.co.at/?i_ca_id=985

22nd International Conference on Acoustics (ICA)

05 to 09 September 2016
Buenos Aires, Argentina
<http://ica2016.org.ar/>

Simposio de Metrología 2016

19 to 23 September 2016
Santiago de Querétaro, México
<https://www.cenam.mx/simposio/>

MMC 2016 – International Conference on Metrology for Meteorology and Climate

26 to 29 September 2016
Madrid, Spain
<http://www.mmc-2016.org/>

BoD Working Group for Capacity Building: Annual Meeting

06 to 07 October 2016
NSAI, Dublin, Ireland

TC-Electricity and Magnetism Annual Meeting

13 to 14 October 2016
BEV, Vienna, Austria

TC-Length Annual Meeting

17 to 18 October 2016
VSL, Delft, Netherlands

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Research & Innovation

METROLOGY FOR ENVIRONMENT

New stable and reproducible measurement standards monitoring environmental changes and the environmental performance of new technologies typically involve measurements with associated low levels of uncertainty over long timescales.

By following a multi-disciplinary approach, EURAMET's coordinated research actions focus on research for robust and stable measurement for monitoring the environment and on research into innovative new systems and technologies that precisely assess environmental parameters.

In 2010 and 2013, EURAMET's European Metrology Research Programme (EMRP) launched a call for projects in this field with an aim to improve data quality for policy making, underpinning environmental research activities and stimulating technological innovation. The projects focus at the local environmental level on air, water and soil pollution, and at the global level on challenges relating to climate change. Earlier this year, the successor programme EMPIR (European Metrology Programme for Innovation and Research) launched another call for Environment projects.

An impact report that outlines the key technical achievements and early impacts of the first group of projects completed under the EMRP Environment theme (2010) will soon be published.

To foster possible solutions for present and upcoming environmental metrology challenges the EURAMET Task Group on "Metrology for Environment" was established in 2014. In the following interview with Andrea Merlone (INRIM, Italy), the Convenor of this task group, an insight into this topic will be provided.

Where do we find metrology for environment in our daily lives and why is metrology important for challenges in the environment sector?

In many more aspects than we might suppose. Environmental and climate concerns affect our lives, regardless of where we live. Accurate measurements of atmospheric parameters such as air and water quality, electromagnetic and noise pollution, radiation level and extreme meteorological events are fundamental everywhere on our planet. We base our life

style on so many indirect environmental impacts, e.g. large scale industrial and power plants, each of them require monitoring, measurements and controlling at levels of uncertainty close to, if not better than the state of the art. But even far from technology, if you are member of an Inuit community or a Berber-Tuareg, you are concerned with what's happening to your environment and how this affects animals, plants and land. We need to improve data quality in essential climate variables to better understand how our climate is changing. Measurements are the basis to guarantee reliable observations and organise mitigation actions for climate change.

What are the objectives of the EURAMET task group for environment?

Our task group has a clear mission; supporting and advising EURAMET regarding all aspects of metrology for environment. This includes collaboration with relevant institutions such as the World Meteorological Organisation (WMO) but also environmental protection agencies and manufacturers. The task group supports EURAMET's Technical Committees and acts for the development of standards, measurement methods and measurement structures. We report to EURAMET on new perspectives, emerging needs and activities related to traceability, quality assurance and calibration procedures for environmental measurements.

Examples are our contribution to EURAMET's Strategic Research Agenda and the input to call scopes within the European Metrology Programme for Innovation and Research (EMPIR). To promote the metrology approach of environmental issues to stakeholder communities the task group has organised a number of events such as the 'Metrology for Meteorology and Climate' conference and 'Metrology for Environment in the Arctic', which is a breakout session at the Arctic Circle, the most important scientific and diplomatic event on Arctic environment.

EURAMET has already taken measures to meet a series of metrology needs in that area. What needs to be done to further support environmental protection?

Climate monitoring and pollution control were well addressed in EURAMET's EMRP 2010 and 2013 environment calls and in



many cases the results go beyond the planned project objectives. Not to forget that better measurements in the climate sector will show their real benefit in the coming years or decades. Doors have been opened and communities have begun talking. The main effort in detecting climate change and therefore supporting environmental protection, should be focussed on how to harmonise and compare the climate data to some reference.

The role of the metrology community is well defined: it's the unique contribution to improving data quality that only metrology can deliver. It is not an SI activity towards the redefinition of a unit, where we have decades and generations of experience. This story is new. And we're training new staff in this multidisciplinary and interdisciplinary field. EURAMET and the associated NMIs and DIs should guarantee that such effort is not limited to the lifetime of joint research projects, but will be an established field of metrology. This should involve the promotion of the coordinated European action performed in the research programmes towards improving measurements for a better knowledge on the state of our environment and climate. We hope the next generation of climatologists will have in their hands accurate, traceable and, most of all, comparable data, in both space and time. The short and long term impact of which must be guaranteed, because there is no planet "B".

About Andrea Merlone

Dr Andrea Merlone is a senior researcher at INRIM, the Italian National Metrology Institute. His focus is on metrology for environment. Andrea is coordinator of two EMRP joint research projects about metrology for meteorology to improve measurements of key climate variables. He is member of relevant international institutions operating in the field of meteorology and climatology such as the World Meteorology Organisation. Additionally, he is chair or member of different committees in EURAMET, BIPM and IMEKO.

HIGHLIGHTS UNDER THE FIRST EMRP ENVIRONMENT THEME

A key challenge facing Europe is the need to ensure sustainable growth, while protecting the environment and safeguarding our quality of life. Meeting the demanding requirements of environmental regulation and climate science presents a range of fundamental and practical measurement challenges. EURAMET's European Metrology Research Programme (EMRP) supports a coordinated approach to research in environmental measurement. The joint research projects under the first call of the EMRP Environment theme focused on

two areas: understanding, modelling and monitoring climate change and ensuring a safe and clean environment. The European Commission and national governments invested 40 million euros in collaborative environmental research involving research groups in 45 European National Metrology Institutes and Designated Institutes, along with 19 academic groups, 27 public agencies with environmental remits and 37 businesses.

Find here a selection of highlights achieved in this first set of nine environment projects.

Improved data for Essential Climate Variables

Much of the data to monitor the internationally-agreed Essential Climate Variables is collected via the world's meteorological agencies. To ensure the relevance and uptake of the EMRP research by this community, EURAMET has deepened the relationship with the World Meteorological Organisation (WMO), international climatology networks and national meteorological organisations. WMO has become a member of the EURAMET Research Council and Environment Task Group that guides EMRP research, and the metrology community is represented on the expert teams of the WMO's Commission for Climatology and Commission for Instruments and Methods of Observation.

An NMI in space – supporting better climate data

EMRP research has made significant developments towards the goal of an 'NMI in space' that will calibrate and validate the climate data from Earth observation satellites. The metrology community worked closely with the European Space Agency and climate scientists to develop and test high-level metrology instrumentation for the space environment. The instrument, a primary radiometer, is capable of a radiometric accuracy of 0.3%, a factor of 10 improvement on previous traceability methods. The instrument is the key component of the planned TRUTHS mission (Traceable Radiometry Underpinning Terrestrial- and Helio-Studies) that will establish an NMI in space.

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Accuracy in the ocean – improved links to the SI units for oceanic data

Ocean circulation is a key component of the climate system and measuring its properties is essential for understanding its role and monitoring changes. EMRP research developed validated and traceable methods, tools and measurement standards for the calibration of ocean-based sensor networks and satellite systems for key ocean parameters including salinity, density, pH and composition of seawater. Significant achievements include the contribution of improved speed of sound data to the International Thermodynamic Equation of Seawater 2010 (TEOS-10) – a key tool in oceanography – and establishment of a link between the conductivity-based practical salinity measurement and the SI units. The metrology community has joined the Joint Committee on Seawater, improving knowledge of metrology best practice among the oceanographic community.

Improving water quality – reducing harmful pollutants

The European Water Framework Directive specifies very low permitted levels of pollutants that present a significant risk to or via the aquatic environment. Toxic pollutants such as tributyltin (TBT), polybrominated diphenylether (PBDE) and selected polycyclic aromatic hydrocarbons (PAH) are particularly harmful as they are liable to accumulate in the food chain and endanger a wide range of living organisms. EMRP research developed validated primary reference methods based on isotope dilution for the analysis of these pollutants in whole water samples at the low levels required to comply with the Directive. These methods allow the quality of measurements made in public and commercial labs to be validated and are already being deployed in a number of European regions.

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Improving air quality – reducing NO₂ emissions

Improving air quality requires accurate measurements of pollutants at the low concentrations permitted by European regulation. EMRP research developed preparation methods for calibration gases for sulfur dioxide, nitric oxide and nitrogen dioxide (NO₂) at or near the limit values of the regulation and a practical portable NO₂ generator for cost-effective calibration of air quality sensors in the field. The NO₂ generator has been used by the City of Zürich Health and Environment Department to calibrate its installed air quality sensors, enabling it to evaluate its pollution reduction strategy and maintain its lead in reducing city centre pollution.

Improving air quality – reducing particulates

Particulates are classified as carcinogenic by the World Health Organisation and each generation of the European emissions regulation reduces the levels permitted in vehicle exhausts. Euro 6, the latest version of the regulation, introduces a limit on particle number as well as particle mass. EMRP research developed a new validated aerosol for calibrating the condensation particle counters used to type-test and certify new engines and ensured its uptake through incorporation of measurement best practice in the relevant ISO standard. The research has supported the development of instrumentation for the new requirement for periodic emissions testing to include both static and on-road conditions. Together these developments in metrology are ensuring that new tighter regulation can be complied with and contribute to reduced harmful emissions.

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METROLOGY FOR ENVIRONMENT - UNDERSTANDING CLIMATE CHANGE

Robust data on the atmosphere, oceans and land, as well as solar and terrestrial radiation, is essential for climate change assessments and effective policymaking. Only through collaborative effort can Europe's National Metrology Institutes make the necessary advances in measurement quality to underpin reliable climate assessments, models and predictions.

Measurement challenge

Monitoring and modelling the Earth's climate requires the measurement of a wide range of climate parameters – the Global Climate Observing System has defined 50 Essential Climate Variables to assess features of the atmosphere, oceans and land. Measurements of these variables need to be comparable irrespective of location and time and the instrumentation or method used.



Courtesy of ESA

At the heart of this challenge is ensuring traceability to the SI units. Daily satellite- and surface-based measurements of climate variables require robust quality assurance, while climate records covering many decades demand rigorous methods for the assignment of measurement uncertainties. Measurement comparability becomes increasingly important as international and national policymakers seek to implement climate protocols, agreements and regulation.

EMRP research has supported improved accuracy of measurement data for Essential Climate Variables and the development of new measurement methods and technologies for example in the 'European metrology for Earth observation and climate' project.

European metrology for Earth observation and climate

Earth observation

Earth observation agencies worldwide are moving towards a more coordinated approach to data gathering. With the increased importance of the data they provide, they are demanding improved measurement accuracy of the instrumentation on board Earth observation satellites. Satellites need to be able to detect changes in the Essential Climate Variables, such as the total solar energy and sea surface temperature, of a few tenths of a per cent per decade. Satellites remain in service for several decades and in-flight calibration is critical to long-term comparability of climate data. A factor of 10 improvement in key variables would enable robust discrimination between the natural variability of the climate system and anthropogenic change in the shortest time possible.

Achieving this accuracy improvement is a long-term global endeavour and the EMRP research project 'European metrology for Earth observation and climate' (ENV04 MetEOC) developed key components of the metrological infrastructure for the calibration and validation of satellite and air-borne radiometric instrumentation, traceable to the SI units. The infrastructure comprises:

- Improved NMI calibration facilities – the LAVRAS (large field-of-view camera systems) calibration facility that provides traceability to transfer standards used to calibrate instrumentation in the field.
- Derivation of uncertainty budgets and procedures for Earth observation measurements.
- Transfer standards and instrumentation for the characterisation of large areas of ocean, vegetation and desert, to be used to confirm satellite-borne instrumentation performance.
- A radiometric transfer standard for the planned TRUTHS mission (an 'NMI in space') with higher sensitivity and accuracy than previously possible. The prototype in-flight primary radiometer is capable of a radiometric accuracy of 0.3%
- A factor of 10 improvement on previous transfer standards.

Research impact

The project is part of a wider endeavour of the metrology community to improve the Earth observation data available to climate scientists. The project team worked closely with the Earth observation community throughout the project to design and demonstrate new capabilities. For example, a portable leaf goniometer was used to generate initial data for a new leaf reflectance reference library, which will enable satellite data to be linked to real bio-geophysical parameters leading to the capability to 'calibrate' Earth targets (e.g.

forests). Based on the work of the project a small sensor web (RADCALNET – developed by a number of space agencies) was constructed to demonstrate the feasibility of SI traceable verification for satellite-based instrumentation flying over ground sites post launch. The new infrastructure will contribute to improved performance of the joint EU and European Space Agency network of Earth observation satellites (Copernicus mission) currently under development.

Project ENV04 MetEOC

The EMRP project 'European metrology for Earth observation and climate' started in 2011 with a consortium of 12 participating institutes from all over Europe. Project coordinator was Nigel Fox from NPL (UK). The project was supported by four researcher grants.

The project is part of EURAMET's European Metrology Research Programme (EMRP), which is jointly funded by the European Union and the EMRP participating countries within EURAMET.

For further information, please go to www.euramet.org/project-env04

A list of all Metrology for Environment projects can be found here <http://www.euramet.org/metrology-for-societys-challenges/metrology-for-environment/>

3D forest reconstruction to improve environmental monitoring

The above mentioned EMRP project 'European metrology for Earth observation and climate' has a follow-on project in progress providing first results:

'Metrology for Earth observation and climate' (ENV53 MetEOC2) produces a 3D reconstruction of forest to improve monitoring techniques.

A team of researchers from NPL, University College London and the University of Oxford used novel imaging techniques to sample a six hectare site of Wytham Woods in Oxfordshire, assessing various different forest properties so that a 3D reconstruction could be produced.

Knowledge of forests is essential to our understanding and mitigation of climate change. Covering about 30% of global land area, forests play a significant role in the delivery of ecosystem services, and the impact of natural and anthropogenic processes on forest resources are of high importance to decision-makers.

EMRP project 'Metrology for Earth Observation and Climate' aims to provide traceability for terrestrial and satellite measurements of key biophysical climate variables, including forest cover, to provide quality-assured data.

The team of researchers sampled the six hectare site of forest with a range of optical devices to assess forest structure, canopy area and the spectral properties of leaves, bark and undergrowth. The measurements taken were used in computational tree models to produce the 3D reconstruction of the site. The ultimate aim is to produce a complete 3D model of the forest for use in 3D radiative transfer models, which will validate other sensors.

Follow-on project: ENV53 MetEOC2

The EMRP project 'Metrology for Earth observation and climate' started in 2014 with a consortium of 16 participating institutes from all over Europe. Project coordinator is Nigel Fox from NPL (UK). The project is supported by three researcher grants so far. The project is part of EURAMET's European Metrology Research Programme (EMRP), which is jointly funded by the European Union and the EMRP participating countries within EURAMET.

For further information please go to <http://www.euramet.org/project-ENV53>

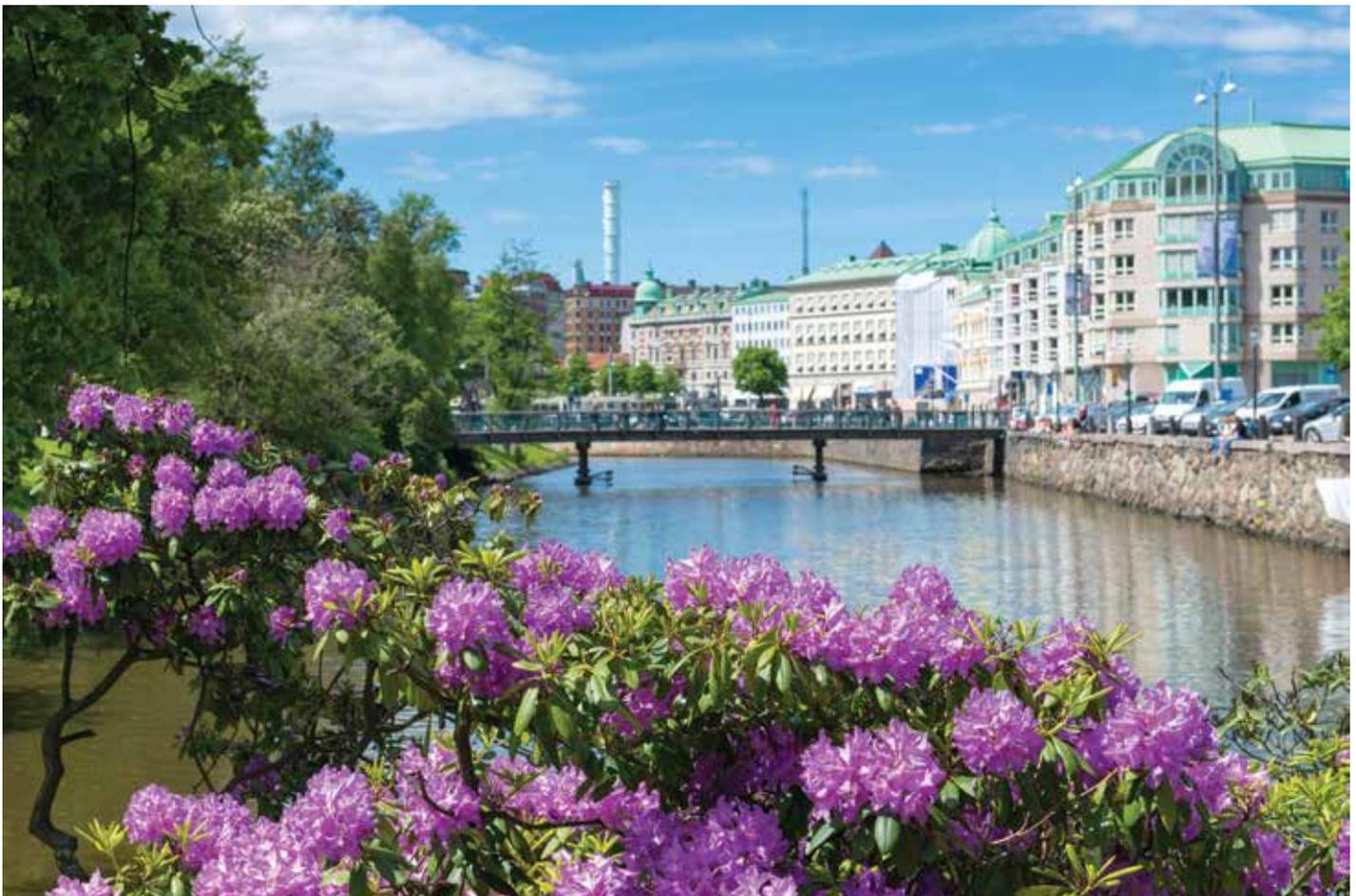
METROLOGY FOR ENVIRONMENT - CREATING A CLEAN, SAFE ENVIRONMENT

Accurate data is essential to monitoring and managing the environment and enabling the design and implementation of effective environmental regulation. Recognising the hazards posed by pollution, the EU has developed an extensive body of legislation which establishes health-based standards and objectives for pollutants in air, water and soil. Key to the successful implementation of these policies is an underpinning measurement infrastructure that ensures that environmental data is robust and consistent across monitoring networks, across national borders and over time.

Measurement challenges

Environmental regulation evolves over time as our understanding increases of the effects of pollutants on human health and the wider environment. This poses an ongoing challenge to the measurement infrastructure. As allowable pollutant levels decrease and new types of pollutant are identified, measurement capabilities must be constantly improved to support robust and fit-for-purpose pollutant monitoring and mitigation. This requires both improved measurement accuracy across the measurement infrastructure and the development of innovative, practical and cost-effective measurement technologies.

EMRP research is improving the quality of environmental monitoring data to ensure the effective implementation of European regulation for example in the 'Metrology for Chemical Pollutants in Air' project.



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Metrology for Chemical Pollutants in Air

Air quality

The EMRP project ENV01 'Metrology for Chemical Pollutants in Air' addressed the need to assess the quality of outdoor and indoor air. The European Air Quality Directive (2008/50/EC) sets challenging limit values and data quality objectives for the measurement of pollutants in ambient air and air monitoring networks have struggled to comply with the objectives because of the lack of metrological transfer standards at and below the pollutant limit values specified. In addition, governments are starting to address the quality of indoor air where harmonised regulation does not exist.

The EMRP project developed:

- Preparation methods for calibration gases for the pollutants SO₂, NO and NO₂ at or near the limit values of the regulation.
- A certified protocol for preparation and validation of 'zero gas' for zero-ing analytical instrumentation. This is essential for measurements of pollutants at very low concentrations.
- Reference methods and reference materials for harmful (semi-) volatile organic compounds ((S)VOCs), which originate from emissions from building materials and contaminate indoor air. Preparation methods for (S)VOC transfer standards at levels of interest for emission testing laboratories were validated and a reference material reproducing the gas emission behaviour typical of a construction product was developed for the quality control of emission test chamber measurements.

- Innovative micro-sensors for air quality monitoring based on graphene. Two types of graphene sensors were tested for the measurement of ambient levels of NO₂ and a protocol for the evaluation of micro-sensors was developed and implemented. A clustered system of micro-sensors, was developed and evaluated as a potential cost-effective method for the measurement of pollutants under the Air Quality Directive. It demonstrated that an artificial neural network of calibrated sensors achieved the best accuracy.

Research impact

The new traceable measurement capabilities will improve comparability of data between the air quality reference laboratories responsible for quality assurance and quality control of the air monitoring networks in each country. The project worked with members of the European Network of Air Quality Reference Laboratories (AQUILA) throughout the project to understand their needs and share the research outputs. The new calibration facilities and tools are being trialled in air quality networks in Switzerland and it is expected that the zero-gas protocol will be incorporated in an amended ISO standard for gas purity.

Supporting roadside pollution monitoring

Congested areas such as city centres suffer from elevated levels of certain pollutants, including NO₂, which is associated with adverse effects on health including reduced life expectancy. As part of the project, METAS in Switzerland developed a new traceable mobile NO₂ permeation generator, which can be used in the field to directly calibrate instruments monitoring harmful roadside pollution, improving the reliability of their measurements.

Research impact

The METAS NO₂ generator has already been used by the City of Zürich Health and Environment Department and in other Swiss cities. METAS and LNI Swissgas, a leading manufacturer of environmental gas calibration systems and gas generators, have been awarded funding to commercialise a novel compact NO₂ permeation generator, which incorporates features of the METAS prototype into LNI Swissgas existing product, resulting in a fully traceable and user-friendly transfer standard.

The new portable calibration method provides crucial support to the expansion of Europe's air monitoring networks, more comprehensive pollution monitoring and effective protection of Europe's citizens.

Project ENV01 MACPoll

The EMRP project 'Metrology for Chemical Pollutants in Air' started in 2011 with a consortium of 12 participating institutes from all over Europe. Project coordinator was Annarita Baldan from VSL (The Netherlands). The project was supported by five researcher grants.

The project is part of EURAMET's European Metrology Research Programme (EMRP), which is jointly funded by the European Union and the EMRP participating countries within EURAMET.

For further information, please go to www.euramet.org/project-env01

A list of all Metrology for Environment projects can be found here <http://www.euramet.org/metrology-for-societys-challenges/metrology-for-environment/>

TAKE PART IN EU CONSULTATION ON METROLOGY RESEARCH

The European Commission has launched a public consultation on the joint programming of metrology research. The survey is about EURAMET's European Metrology Research Programme (EMRP) and the European Metrology Programme for Innovation and Research (EMPIR).

In the survey participants can provide their view on the current status of the European metrology research system and the challenges it is facing. The aim of the consultation is to gather input to

analyse the experience gained during the preparation and implementation of EMRP and EMPIR, assess how the programmes can best contribute to policy developments and to identify critical issues and to propose adjustments if necessary.

The EURAMET Chairpersons would like to encourage the EURAMET and broader metrology communities and their stakeholders to take part in the public consultation.

The survey consists of five sections including relevance of metrology research, objectives of EMRP and EMPIR and the possibility of a future research programme. It should take no longer than 15 minutes to complete.

The public consultation is open until Friday 7 October 2016.

Access the consultation on <https://ec.europa.eu/eusurvey/runner/MetrologyResearch-2016>

Collaboration & Network

EURAMET PLANS FURTHER COLLABORATION WITH NCSLI INTERNATIONAL



NCSLI INTERNATIONAL
Serving the World of Measurement

In 2015, a Memorandum of Understanding was signed by NCSLI International (NCSLI) and EURAMET marking a long tradition of collaboration. At the EURAMET General Assembly a few weeks ago, NCSLI and EURAMET met to discuss further steps. "Both organisations have and will continue to benefit from the exchange of information," says EURAMET Chairperson Beat Jeckelmann. "A major goal is the development of technical position papers and documents that are mutually beneficial to the organisations, their membership and the metrology community at large."

"NCSLI and EURAMET are leading technical organisations that work to promote advancement in metrology and the measurement community. I believe both organisations benefit by participating in each other's annual meetings and by sharing technical documents such as EURAMET's calibration guides. Through our continued interaction, we can further build and enhance our partnership," comments Roger Burton, NCSLI President.

Already in 2007, NCSLI and EURAMET signed their first letter of intent and became liaison organisations. NCSLI is a professional trade organisation located in Boulder, Colorado (US). Its mission is to "provide the best opportunities for the measurement science experts and practitioners regarding exchange of information, promotion of measurement education and to develop means for organisations to resolve measurement challenges."

The membership is open to any organisation with an interest in measurement science and its applications in research, development, education and commerce. Members are companies, organisations, individual professionals and students. This wide representation of experience provides an opportunity to exchange ideas, techniques and innovations with others engaged in the measurement science community.

NCSLI was formed in 1961 to promote cooperative efforts for solving the common problems faced by measurement laboratories. Today, NCSLI has over 1000 member organisations from academic, scientific, industrial, commercial, and government facilities around the world.

NCSLI 2016 Workshop & Symposium – "Measurement Accuracy and the Impact on Society"

One of the main events of NCSLI is its annual Workshop & Symposium. This year's topic is "Measurement Accuracy and the Impact on Society." The five-day event from July 24 to 28, 2016, in Saint Paul, Minnesota will bring measurement science experts and professionals together to share the latest and most relevant news, experiences and stories relating to metrology's place in society.

The conference offers multiple ways to network with industry professionals and includes hands-on tutorials, technical papers, poster presentations, keynote addresses, exhibition hall, committee meetings and networking.

For further information go to www.ncsli.org

Community News



COLLABORATION AND DECISIONS FOR FURTHER DEVELOPMENT – EURAMET GENERAL ASSEMBLY 2016 IN NORWAY

The Norwegian capital of Oslo was the backdrop for EURAMET's 10th General Assembly. The gathering of the EURAMET community from 23 to 27 May 2016 was filled with important events: the General Assembly, the EMPIR Committee Meeting, the meeting of EURAMET's Research Council and a scientific symposium.

The General Assembly week is traditionally used to exchange information about achievements and highlights of the last year which were accomplished within the different committees and bodies of EURAMET. Discussions and decisions were made concerning future developments of the organisation such as new advisory tasks of the Research Council or a possible new working group for Designated Institutes.

For EURAMET it is of particular importance to foster the collaboration between the different fields of expertise such as the TCs, the Task Groups and the research programmes. The interdisciplinary approach supports the further development and strategic planning of the organisation. Therefore, TC Chairs and Task Group Convenors were invited to present the latest

developments and visions for the future in their fields, including results from several joint research projects. The visionary presentations and talks provided input for lively discussions between the audience and the speakers.

"I was impressed with the quality of the technical presentations" said EURAMET Chairperson Beat Jeckelmann. "We have seen convincing evidence for important results and impact of our joint research projects and experienced an inspiring exchange of views on the challenges lying ahead of us."

During the General Assembly Maria Luisa Rastello (INRIM, Italy) was elected as new EURAMET Vice-Chairperson (GA) for the term until 2019 and follows Janko Drnovšek (MIRS/UL-FE/LMK, Slovenia), whose term ended in May 2016. EURAMET expressed its sincerest thanks to Janko and welcomed Maria Luisa in her new role (see page 13). Maguelonne Chambon (LNE, France), Pavel Klenovsky (CMI, Czech Republic) and Jörn Stenger (PTB, Germany) were elected as members of the Board of Directors for the period of 2016 to 2018 and three Technical Committee (TC) Chairs were re-elected for a second term of office. These are Robert Edelmaier (BEV, Austria) for TC Interdisciplinary Metrology, Enver Sadikoglu (UME, Turkey) for TC Quality and Graham Machin (NPL, UK) for TC Thermometry.

EURAMET is happy to welcome a Designated Institute as new Associate. The 'Laboratory of Geophysics of the University of Luxembourg' (LGUL), which works in the fields of Mass and Related Quantities and Gravity, was accepted by the General Assembly.

"We are very grateful that Justervesenet hosted the General Assembly 2016. Thanks to the perfect organisation and the nice atmosphere, we had a week full of productive meetings", said Beat Jeckelmann on behalf of the association. With 99 participants, the General Assembly week was again very well attended. The meetings and the general programme were hosted and organised by Justervesenet (JV), the Norwegian National Metrology Institute. Hans Arne Frøystein, acting director of JV and EURAMET Alternate provided an introduction to Norway, which has a very long metrological history and was therefore a suitable place for such an event.

Justervesenet (JV) – host of the 10th EURAMET General Assembly

Justervesenet, the Norwegian Metrology Service and National Metrology Institute, hosted EURAMET's General Assembly 2016. Justervesenet (JV) was established in 1875 and is a governmental agency under the Ministry of Trade, Industry and Fisheries. The institute is responsible for the Norwegian metrology infrastructure and for ensuring its national and international acceptance. Justervesenet has two main responsibilities: legal metrology and national measurement standards. JV participates in a number of joint research projects within EURAMET's European Metrology Research Programmes (EMRP and EMPIR).

Hans Arne Frøystein, acting director of JV, and his committed team organised the General Assembly week with excellent professionalism and within an atmosphere of great hospitality.

EURAMET GUIDE ON COMPARISONS PUBLISHED

EURAMET is happy to announce that guide No. 4, 'EURAMET Guide on Comparisons', has been published. The guide describes all aspects of planning, initiating and conducting inter-laboratory comparisons within EURAMET and harmonises criteria among different Technical Committees (TCs).

"During my work as Chair of EURAMET's TC for Flow I realised that an improvement in the organisation of EURAMET comparisons would be useful, especially the harmonisation of the

procedure within the TCs. This guide will help laboratories to understand the different types of EURAMET comparisons, the rules of their organisation, how to deal with the results and how to produce reports", explains Elsa Batista from IPQ (Portugal).

The guide is aimed at all people who are involved in comparisons, especially EURAMET Contact Persons from Technical Committees organising or taking part in comparisons.

"EURAMET Guide No. 4 addresses the need to give specific guidance on carrying out comparisons within EURAMET. It is particularly useful in case of EURAMET comparisons that are not Key Comparisons (KCs) or Supplementary Comparisons (SCs). In this case the harmonisation of criteria among different Technical Committees, whenever possible, is a major issue, together with the need to establish

general rules for the participation of guest expert laboratories", comments Michela Segal from INRIM (Italy).

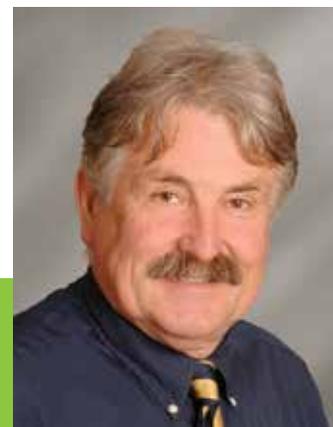
The EURAMET guide should always be used in combination with CIPM MRA-D-05 'Measurement comparisons in the CIPM MRA' and guiding documents of the relevant Consultative Committee of the Metre Convention (CC). Internal guidance documents for specific TCs may also be available.

The authors of the guide are Wolfgang Schmid (EURAMET), Michela Segal (INRIM, Italy), Elsa Batista (IPQ, Portugal) and Beat Jeckelmann (METAS, Switzerland).

The guide is available at www.euramet.org/publications-media-centre/documents-and-publications

People & EURAMET

EURAMET PIONEER FROM THE VERY START – JANKO DRNOVŠEK – PAST EURAMET VICE-CHAIRPERSON (GA)



The term of a EURAMET institution comes to an end. Janko Drnovšek (Slovenia) was Delegate and Vice-Chairperson (GA) of EURAMET until May 2016. *"Throughout his many years in term Janko preserved a high level of commitment and enthusiasm for EURAMET. He cares a lot for people and for the association,"* says Beat Jeckelmann, EURAMET Chairperson. *"It is hard to believe that Janko's term has come to an end."*

Janko has been EURAMET's Slovenian Delegate from 2007 and Vice-Chairperson (GA) from 2010. In these roles he has actively contributed to shaping and developing the association. His main areas of interest were the full integration of Designated Institutes (DIs) within EURAMET, capacity building and European accreditation. *"On behalf of the whole organisation I would like to express our sincerest thanks to Janko. His work and contribution for EURAMET cannot be overstated,"* comments Beat.

As a member of EURAMET's Board of Directors Janko took over responsibility for the 'Focus Group on Facilitating National Metrology Infrastructure Development' and was responsible for the establishment of the new 'Working Group on Capacity Building'. As Vice-Chairperson (GA) he represented EURAMET in the European Accreditation Advisory Board. Janko actively participated in the development of EURAMET's guides No. 1 'EURAMET and the Operation of NMI's' and No. 2 'Role of Designated Institutes within the CIPM MRA' (former guides No. 10 and No. 11), the EURAMET 2020 strategy and EMPIR's capacity building programme.

Janko is very experienced in metrology collaboration and well connected at an international level. He participated in a large number of EURAMET projects and joint research projects within the European Metrology Research Programme.

Janko works for the Slovenian DI 'MIRS/UL-FE/LMK' and is professor for Measurement Science, Metrology, Quality Systems and European Technical Legislation. Additionally, he is the head of the Laboratory of Metrology and Quality, Chair of the Department of Measurements and Robotics and member of the Management Board of the University of Ljubljana. In 1991 he was one of the founders of the Slovenian distributed national metrology system and the Slovenian National Metrology Institute, MIRS. Janko is the Slovenian representative for the International Measurement Confederation and chairman of the Slovenian Society for Process Control and Measurements.

"I have received so many nice words from people all over EURAMET and I would like to thank them all. It was a pleasure to work with all the committed people within EURAMET and I have learned a lot under three different Chairpersons," says Janko. *"I wish my successor as Vice-Chairperson (GA), Maria Luisa Rastello, all the best for her new task."* Janko Drnovšek will stay in the EURAMET community as DI Contact Person.

INTERVIEW

Janko, you have been contributing to EURAMET for a very long time. How did you originally get involved in EURAMET?

At the beginning of my engineering career I was engaged in bilateral research projects in measuring instrumentation and later in setting up metrology infrastructure systems in terms of assuring traceability, dissemination and calibration techniques. Within these activities I was lucky to have the support of the BIPM and numerous NMIs. When Slovenia became independent in 1991, our Society for Process Control and Measurements had already prepared a full national metrology strategy, paving the way to a distributed metrology system with nine DIs and one NMI.

During that time, I received a lot of support from the Western European Calibration Cooperation and then from EUROMET. The major event was when Slovenia became member of EUROMET in 1996. From then on, Slovenian metrology was closely linked to EUROMET and later EURAMET, being active in all relevant bodies. I am convinced that without EURAMET, the Slovenian metrology systems would not be as they are today. We owe our current national metrology level and position to EURAMET as an organisation and EURAMET as an assembly of its members.



EURAMET/Anne Trumpfheller

"I have received so many nice words from people all over EURAMET and I would like to thank them all. It was a pleasure to work with all the committed people within EURAMET and I have learned a lot under three different Chairpersons," says Janko. "I wish my successor as Vice-Chairperson (GA), Maria Luisa Rastello, all the best for her new task."

What do you consider as successes or failures during your involvement with EURAMET?

One major success over the last 25 years is that many smaller national metrology laboratories have emerged and demonstrated their ability to progress and became an integral part of the European metrology landscape. As a representative from a smaller country, I really appreciated the extremely fair relationship with and attitude from representatives of more established laboratories. This ensured a more balanced European development, which is one of the priorities of the European Commission. I consider it as a big success that besides NMIs, as EURAMET members, also DIs, as associates, have the possibility to participate in almost all of EURAMET activities (except voting).

However, not only in my country but in many others too, there is a broader European acknowledgement of our metrology achievements than at our own national levels. This lies of course purely in the national sovereignty, beyond EURAMET. But nevertheless, indirectly it effects EURAMET. This I consider as a failure.

What are your plans for the future?

I have to admit that being active in EURAMET, was one of the highlights of my professional career. This is not primarily due to the metrological issues but due to the personal relationships and the spirit of the organisation. As EURAMET has introduced the possibility for full engagement of DI representatives, I am looking forward to contribute to further developments of the DI integration process, relations with the European Accreditation and the study on coordination in metrology.

MARIA LUISA RASTELLO IS NEW VICE-CHAIRPERSON (GA) FOR EURAMET



Dr Maria Luisa Rastello from INRIM (Italy) was elected as EURAMET Vice-Chairperson (GA) at the General Assembly held in Oslo, Norway in May 2016.

"On behalf of EURAMET I would like to congratulate Maria Luisa on her election. My colleagues and I at the Board of Directors wish her all the best for her new role", said Beat Jeckelmann, EURAMET Chairperson, when announcing the results of the election.

Maria Luisa joined INRIM, the Italian National Metrology Institute, in 1979 where she started working in photometry and radiometry. Maria Luisa pioneered the metrology for Quantum Communications by weak laser beams and the photon counting techniques for absolute radiometry. Additionally, she introduced the concept of photon-number resolving detectors for space applications and contributed to its realisation.

In 2001 Maria Luisa became Head of the Department of Photometry and Radiometry. Six years later she took over the Division of Optics and since 2014, has been the Scientific Director of INRIM.

Maria Luisa has been part of the EURAMET community for more than 15 years, starting as Contact Person and later as Chair for EUROMET's Technical Committee for Photometry and Radiometry. Meanwhile she is the Italian Delegate for EURAMET (since 2010) and in 2013 she took over responsibility for the whole association by joining the Board of Directors.

Maria Luisa is deeply involved in EURAMET's research programmes (EMRP and EMPIR) as coordinator of several EMRP joint research projects and as EMPIR Committee Deputy.

On an international level Maria Luisa is also well experienced thanks to various roles such as peer reviewer and visiting professor.

INTERVIEW

Maria Luisa, congratulations to your election. What are you most excited about and looking forward to in your term?

I am excited about contributing to the further development of EURAMET in many different ways. I have already had the chance to contribute to the shaping of the association as member of the Board of Directors, but being Vice-Chairperson (GA) brings even more possibilities. I am also looking forward to collaborating with all the highly committed people behind the organisation.

Which tasks will you focus on as Vice-Chairperson (GA)?

There are of course many tasks which I would like to conduct. One example is the simplification towards an even more trustworthy and sustainable Mutual Recognition Agreement. I have already contributed to the position paper prepared by the ad-hoc Working Group dealing with that task and as Vice-Chairperson (GA) I will follow this subject closely. Additionally, I would also like to take up a task of my predecessor Janko Drnovšek: the better integration of Designated Institutes within EURAMET.

What is your vision for EURAMET during your three years term and what are the challenges?

In the next three years it is important to pave the way for a strategy which will guarantee EURAMET's sustainability beyond its research programmes (EMRP and EMPIR). As Vice-Chairperson (GA) I will take a leading role in that together with my colleagues from the Board of Directors. To compliment this, I also think it is necessary to focus on the development of a more coherent European metrology infrastructure. These two topics are major challenges for the next years.

What skills and experience from your role as Scientific Director at INRIM will support you in your new role as Vice-Chairperson?

My various positions and tasks have and continue to span many disciplines. Over the last few decades I have been able to gain a broad insight into different needs in different fields of metrology, in both management and scientific work. Additionally, I am always trying to take into account the needs and positions of the people involved in tasks and decisions to find good agreements. I think this knowledge and experience can be very helpful for my term as Vice-Chairperson.

ULRIKE ANKERHOLD – NEW TC-CHAIR FOR IONISING RADIATION (TC-IR)



Ulrike Ankerhold is the new chair of the Technical Committee for Ionising Radiation. Ulrike has taken over from Lena Johansson (formerly NPL, UK) who successfully chaired TC-IR from 2013 to 2016. *"As TC chair I would like to strengthen the interdisciplinary work and the collaboration with other TCs, organisations and non-metrology institutes to build networks beyond my TC. An important aspect is the discussion about the coherent approach of the metrology infrastructure, especially in ionising radiation where complex facilities for the realisation and dissemination of measuring quantities are very expensive in purchasing and operation."*

Ulrike has been head of the department for Dosimetry for Radiation Therapy and Diagnostic Radiology at the Physikalisch-Technische Bundesanstalt (PTB), the German

National Metrology Institute, since 2009. Ulrike obtained a PhD in Physics at the University of Bonn in Germany on molecular spectroscopy using synchrotron radiation. She joined PTB in 1997 and started working at the department for Radiation Protection Dosimetry.

Ulrike is a member of EURAMET's Task Group for Health and of several international and national standardisation groups in ISO, IEC and DIN.

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