



Introduction to the Acta IMEKO Special Issue on the 2025 IMEKO TC8, TC11 and TC24 Joint Conference

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Dear Readers,

This Special Issue collects the extended version of some of the contributions presented at the 2025 IMEKO TC8, TC11 and TC24 Joint Conference, held in Torino (Italy) from the 14th to the 17th of September 2025. This international conference gathered experts both from industry and academia, covering different topics from the field of 'Traceability in Metrology' (IMEKO TC8), 'Measurement in Testing, Inspection and Certification' (IMEKO TC11), and 'Chemical Measurements' (IMEKO TC24). Considering the wide interdisciplinarity of the three Technical Committees, many topics and metrological issues were addressed by the Conference participants. The Conference featured 3 keynote presentations (given by Dr Vito Fericola, Prof. Eugenia Eftimie Totu, and Dr Claudia Koch), 13 technical oral sessions over three days, and an insightful poster session. Among the 88 presented contributions, some of them were further developed and expanded, in order to be part of this Special Issue. In the following, the published papers will be individually presented.

The paper 'A comparative analysis of reactive power/energy measuring algorithms in non-sinusoidal conditions by using the fundamental reactive power as a reference' by K. Demerdziew et al. [1] addresses an important issue in electrical measurements. The readings of different, commercially available, reactive power/energy instruments in harmonically distorted conditions is experimentally verified first against the fundamental reactive power as a reference quantity, in accordance with IEEE 1459. Then, a mutual inter-comparison between different algorithm-based instruments is carried out, as a contribution to the perspective of an unbroken traceability chain establishment in the domain of reactive power and energy in non-sinusoidal conditions.

The study 'Integration of Monte Carlo simulation for uncertainty evaluation into intra-laboratory comparison for reference standards consistency assessment' by K. Demerdziew and co-authors [2] presents an intra-laboratory comparison, as an additional tool for quality assurance. The measurement uncertainty is evaluated according to the principles presented in the Guide to the expression of uncertainty in measurement (GUM), as well as by using the Monte Carlo simulation concept of distribution propagation. By regarding the different principles for resistance measurement, implemented in the selected instrumentation and the two methods for uncertainty calculation, this intra-laboratory comparison offers a quantitative assessment of the consistency and reliability of the selected reference standards, thereby enhancing confidence and credibility of the measurement results provided by the laboratory.

In the paper 'Monte Carlo-based uncertainty quantification for conformity assessment and traceable calibration of high-frequency instrumentation' by M. Cundeve-Blajer et al. [3], the Authors present the development of uncertainty models for traceable oscilloscope calibration, conducted within the Laboratory for Electrical Measurements at Ss. Cyril and Methodius University in Skopje, aligned with EURAMET cg-7 guidelines. Using a software originally created at the Ss. Cyril and Methodius University in Skopje -the MonteCalc Uncertainty Toolkit- the study compares the uncertainty evaluation results obtained according to the GUM methodology and by the application of the stochastic Monte Carlo method embedded in the MonteCalc Uncertainty Toolkit. These data fusion approaches are then applied to experimental data from a high-frequency calibration of diverse types of oscilloscopes for validation purposes.

The paper 'Structure-property-migration relationships in polyethylene food packaging: FTIR classification, DSC crystallinity, and UV-absorbing contaminants in ethanol

simulants' by A. C. Alcantara et al. [4] addresses an important issue for the food industry, i.e. the migration of contaminants from polymeric packaging. This study evaluated the migration of UV-absorbing contaminants from commercially available polyethylene packaging films, using an integrated structure–property–migration approach. The results highlight the importance of considering polymer structure and thermal properties when interpreting migration screening results and support the use of complementary analytical techniques for the preliminary assessment of food-contact materials.

The paper 'Evaluation of uncertainty of electric and magnetic field measurement and calculation results in the vicinity of transmission overhead power lines' by M. Grbić et al. [5] is related to the assessment of exposure of the general public to extremely low-frequency electromagnetic fields in the vicinity of transmission overhead power lines, based on measurements and calculations of electric and magnetic fields. The study demonstrates that measurement and calculation uncertainties must be properly considered when assessing compliance with exposure limits. The presented methodology provides reliable results and is particularly important for the accurate evaluation of public exposure to electromagnetic fields, and for demonstrating compliance with the prescribed reference levels.

In the study 'QuEChERS-based determination of ethoxyquin in chicken by LC-FLD and isotope dilution LC-MS/MS' [6], A. G. H. Bion and co-authors develop and validate a trace determination of ethoxyquin in chicken, useful for food analysis. The limits of detection and quantification were 2.4 and 3.6 µg/kg for LC-FLD, and 1.7 and 2.5 µg/kg for LC-IDMS/MS. Both methods exhibited excellent linearity using matrix-matched calibration. The developed method was successfully applied to the homogeneity and stability analysis of EQ in a chicken-based reference material.

The paper 'Migration of total UV-absorbing contaminants from Philippine polypropylene microwavable containers: Effects of food simulant, contact time, and temperature' by E. K. P. Encarnacion et al. [7] investigates the influence of different parameters in the migration of contaminants from food containers. The results show that migration behaviour is affected by the nature of the contacting medium, with greater apparent migration under less polar, fatty, and oily simulant conditions. The observed time- and temperature-dependent trends also support the importance of considering actual handling, storage, and reheating conditions when assessing plastic food-contact articles.

In the study 'Operationally stable pH measurement in wastewater treatment using a photocatalytic self-cleaning electrode: Extended field evidence and uncertainty-oriented performance indicators' [8], the Authors characterise the performance of a pH electrode by focusing on uncertainty-oriented operational indicators derived from grouped observations, rather than on a complete formal GUM uncertainty budget. Statistical indicators included agreement with laboratory reference measurements, rolling median absolute deviation, grouped daily statistics, trend analysis, and distributional behaviour. The study demonstrates how grouped-observation analysis, robust statistics, and operational uncertainty indicators can complement conventional calibration-based assessment in continuous environmental sensing applications.

The paper 'Screening mercury (Hg) presence in Philippine milkfish (Chanos chanos) using total reflection X-ray fluorescence (TXRF)' **Fehler! Verweisquelle konnte nicht**

gefunden werden. presents the validation of a method for the analysis of mercury content in Philippine milkfish. The method was then applied to milkfish samples harvested from different areas around Laguna de Bay and the analyses showed that no mercury was detected in the samples.

In the paper 'Assessment and characterization of microplastic contamination in milkfish (Chanos chanos) from marine aquaculture systems in the Philippines' **Fehler! Verweisquelle konnte nicht gefunden werden.**, L. Jerisa Castro and co-authors investigate the microplastic contamination in milkfish harvested from nine mariculture sites in the Philippines. Results revealed that five types of polymers were identified, namely polyethylene (PE), polypropylene (PP), polyamide (PA), polyethylene and cellulose-based polymers. This study offers an important contribution to understanding microplastic contamination on tropical aquaculture species and highlights the urgency of implementing effective management strategies to address this escalating environmental concern.

The contribution 'Investigation of the correlation between increased error in hydrocarbon dew point determination and high CO₂ content in natural gas' by M. Plaskach and co-authors [11] addresses an important issue for natural gas transmission and underground storage. Indeed, this technical note reports preliminary evidence that elevated CO₂ content is associated with abnormal hydrocarbon dew point response in operational monitoring data. Thanks to the preliminary findings reported, a practical laboratory validation roadmap is proposed.

To conclude, we would like to thank all the Authors for the insightful papers submitted to this Special Issue and all the Reviewers for their remarkable work.

We hope you will enjoy your reading.

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Section Editors

REFERENCES

- [1] K. Demerdziev, V. Dimchev, A comparative analysis of reactive power/energy measuring algorithms in non-sinusoidal conditions by using the fundamental reactive power as a reference, *Acta IMEKO* 15 (2026) 2, pp. 1-11.
DOI: [10.21014/actaimeko.v15i2.2281](https://doi.org/10.21014/actaimeko.v15i2.2281)
- [2] K. Demerdziev, M. Cundeva-Blajer, Integration of Monte Carlo simulation for uncertainty evaluation into intra-laboratory comparison for reference standards consistency assessment, *Acta IMEKO* 15 (2026) 2, pp. 1-13.
DOI: [10.21014/actaimeko.v15i2.2282](https://doi.org/10.21014/actaimeko.v15i2.2282)
- [3] M. Cundeva-Blajer, G. Dimitrovski, M. Nakova, K. Demerdziev, Monte Carlo-based uncertainty quantification for conformity assessment and traceable calibration of high-frequency instrumentation, *Acta IMEKO* 15 (2026) 2, pp. 1-20.
DOI: [10.21014/actaimeko.v15i2.2285](https://doi.org/10.21014/actaimeko.v15i2.2285)
- [4] A. C. Alcantara, J. A. Mendoza, V. Z. Tabao, E. K. P. Encarnacion, R. M. S. M. Ting, W. P. Alejandro, A. F. Del Rosario, D. J. Alcarde Jr., Structure–property–migration relationships in polyethylene food packaging: FTIR classification, DSC crystallinity, and UV-absorbing contaminants in ethanol simulants, *Acta IMEKO* 15 (2026) 2, pp. 1-8.
DOI: [10.21014/actaimeko.v15i2.2286](https://doi.org/10.21014/actaimeko.v15i2.2286)
- [5] M. Grbić, A. Pavlović, Evaluation of uncertainty of electric and magnetic field measurement and calculation results in the vicinity

- of transmission overhead power lines, *Acta IMEKO* 15 (2026) 2, pp. 1-9.
DOI: [10.21014/actaimeko.v15i2.2295](https://doi.org/10.21014/actaimeko.v15i2.2295)
- [6] A. G. H. Bion, A. C. Dacuya, A. T. Junsay, B. S. Ebarvia, QuEChERS-based determination of ethoxyquin in chicken by LC-FLD and isotope dilution LC-MS/MS, *Acta IMEKO* 15 (2026) 2, pp. 1-9.
DOI: [10.21014/actaimeko.v15i2.2297](https://doi.org/10.21014/actaimeko.v15i2.2297)
- [7] E. K. P. Encarnacion, S. M. J. M. Pukunum, M. J. F. Mantile, J. A. T. Mendoza, R. M. S. M. Ting, A. C. Alcantara, W. P. Alejandro, A. F. Del Rosario, D. J. Alcarde Jr., Migration of total UV-absorbing contaminants from Philippine polypropylene microwavable containers: Effects of food simulant, contact time, and temperature, *Acta IMEKO* 15 (2026) 2, pp. 1-8.
DOI: [10.21014/actaimeko.v15i2.2298](https://doi.org/10.21014/actaimeko.v15i2.2298)
- [8] A. R. De Guzman, E. K. P. Encarnacion, Operationally stable pH measurement in wastewater treatment using a photocatalytic self-cleaning electrode: Extended field evidence and uncertainty-oriented performance indicators, *Acta IMEKO* 15 (2026) 2, pp. 1-7
DOI: [10.21014/actaimeko.v15i2.2299](https://doi.org/10.21014/actaimeko.v15i2.2299)
- [9] A. J. E. Tabuso, J. K. C. Valerio, A. J. D. Rocha, A. T. Junsay, K. C. C. Aganda, Screening mercury (Hg) presence in Philippine milkfish (*Chanos chanos*) using total reflection X-ray fluorescence (TXRF), *Acta IMEKO* 15 (2026) 2, pp. 1-5.
DOI: [10.21014/actaimeko.v15i2.2300](https://doi.org/10.21014/actaimeko.v15i2.2300)
- [10] L. J. Castro, J. P. Arcilla, J. C. Gabunada, C. Mendoza, C. J. Carlos, A. Tobias, M. R. Gean Aledia, A. Alcain, A. Monsada, K. C. Aganda, Assessment and characterization of microplastic contamination in milkfish (*Chanos chanos*) from marine aquaculture systems in the Philippines, *Acta IMEKO* 15 (2026) 2, pp. 1-12.
DOI: [10.21014/actaimeko.v15i2.2301](https://doi.org/10.21014/actaimeko.v15i2.2301)
- [11] M. Plaskach, V. Lutsenko, A. Levytskyi, Investigation of the correlation between increased error in hydrocarbon dew point determination and high CO₂ content in natural gas, *Acta IMEKO* 15 (2026) 2, pp. 1-3.
DOI: [10.21014/actaimeko.v15i2.2334](https://doi.org/10.21014/actaimeko.v15i2.2334)