

IV Arctic Metrology Workshop

7th november 2019

Workshop program

- 9.00 Opening and introduction of the workshop: Angelo Viola ISP-CNR
- 9.10 The Arctic Metrology workshops series and associated events: Graziano Coppa – INRiM
- 9.20 EURAMET, The metrology for environment in Europe and for the Arctic (Hans Arne Frøystein /Åge Andreas Falnes Olsen – EURAMET Chair)
- 9.30 The WMO activities in metrology for climate monitoring: GCOS, GCW, CIMO, CCI initiatives: Graziano Coppa- INRiM
- 9.40 Metrology outreach and impact on Polar initiatives: Vito Vitale ISP- CNR
- 9.50 The 2014 - 2019 Metrology campaigns in Ny-Ålesund Graziano Coppa – INRiM
- 10.00 The metrology lab in Ny-Ålesund: a common infrastructure for data quality. Angelo Viola ISAC-CNR
- 10.20 Coffee break
- 10.40 The Climate Change Tower measurements, improving the accuracy of temperature profiles and measurements by accurate calibrations: Angelo Viola – ISAC-CNR
- 11.00 Metrology for CO₂ content in water: Michela Segà – INRiM
- 11.20 Measurement of surface variables: issues and uncertainties: Mareile Astrid Wolf – Norwegian Met Office
- 12.00 Lunch
- 13.30 Roundtable – Implementing a permanent metrology infrastructure in the Svalbard
- 17.00 Future plans and conclusion

Multitudes of measurements are needed to understand the environment and its evolution. In the Arctic, dedicated efforts are motivated by the higher accuracy required to quickly capture faster trends, the extreme range and conditions of sensors exposure, a robust comparability asked by the different measurement networks, the need of special calibration procedures, the logistical problems associated with remote locations. Metrology, the science of measurement, can bring a unique contribution in establishing traceability, enforcing comparability and reducing uncertainties in data records. Arctic stations measurements, integrated projects and networks as well as scientific infrastructures, can benefit from the availability of dedicated measurements and calibration procedures, together with the opportunity to perform on site instruments validations. The scope of the session is to promote a discussion board for planning common activities between the metrology community and the scientific research communities operating in the Arctic, to improve data quality.

The **Svalbard** research community and infrastructures offer a unique opportunity to establish a fruitful cooperation with the metrology community, to improve data quality.

Following the previous three editions in Torino (Italy), Oslo (Norway), and Ny-Ålesund, the IV Arctic Metrology Workshop is proposed:

- to address metrology experience and activities on the arctic environmental measurements and research;
- to report on previous metrology activities and campaigns in the Arctic;
- to present the expertise of European Metrology Institutes to the scientific communities operating in the Arctic;
- To report the project and ongoing activities plan to implement the **permanent common metrology laboratory and infrastructure in Ny-Ålesund**.

As part of the Ny-Ålesund atmospheric scientific community will be involved in the observation programs of MOSAIC campaign, the workshop will represent an important opportunity to promote the achievements of full reliability and comparability in space and time of the measured records, traceability of the data and uncertainty evaluations. These metrological aspects will be discussed with experts to improve data reliability in the Arctic.

A round table is also proposed to close the event, to address the metrology laboratory activities towards the requirements of the scientific community operating in Ny-Ålesund and in the Svalbard.

Workshop participant list

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Michela Segà – INRiM – m.sega@inrim.it

Workshop scientific outcome

The workshop has underlined the fruitful cooperation between INRiM and ISP-CNR on the topic of Arctic metrology. The interest of the Norwegian Met Office in the topic, especially in terms of evaluation of uncertainties for in-field measurements, has been established.

The Ny-Ålesund common metrology laboratory at Vaskerilab has proven its worth, with established procedures (standard thermometers travelling back and forth between INRiM and Ny-Ålesund while instruments reside in Vaskerilab) and instrument calibrations performed routinely.

It has also help established some new links: discussions during the workshop have sparked some new scientific interactions and currently a paper is being written on the atmospheric sciences implications of the metrological work done in Ny-Ålesund by INRiM and ISP-CNR (then ISAC-CNR) during the campaign of 2018.

Workshop recommendations

The Ny-Ålesund common metrology laboratory at Vaskerilab, already equipped and operating in Ny-Ålesund since the INRiM campaign of 2018, needs to be better advertised in the local scientific community as well as to all the operators involved in measurements in the area.

It also needs an upgrade in terms of equipment and types of instruments that can be calibrated and characterized. This can be done only with an external funding.

Identified possibilities are:

- SSG Norwegian grant of ~4 mil NOK. Issues: not much money and 1 of the partners should be a Norwegian research institute (JV is not considered as such). Deadline 16th December, too close to develop a partnership with other Norwegian research institutes
- Introduce and expand the topic to European Metrology Network.
- Infrastructure grant of Italian Ministry.

Graziano Coppa

29/06/2020