3rd **Weather Radar Calibration Workshop**

17-19 November 2021
Météopole, Toulouse, France

Wednesday, 17 November 2021

08:00 – 09:00 **Registration**

Session 1: Introduction

09:00 – 09:20 **Welcome address**
Isabelle Donet (director of DSO), Axel Deloncle (director of CMR)
Météo-France

09:20 – 09:40 **Introduction to the WXRCalMon2021 Workshop**
Nicolas Gaussiat, Jordi Figueras
Météo-France

Session 2: Software

09:40 – 10:00 **Perspicacious radar polarimetric spectral filtering: Adaptive thresholding using the copolar correlation**
Albert Oude Nijhuis
SkyEcho

10:00 – 10:20 **Monitoring the Quality of Quality-controlled Radar Moments**
Annette Boehm
DWD

10:20 – 11:00 **COFFEE BREAK**

Session 3: Monitoring of threats to radar networks

11:00 – 11:20 **RF - interference mitigation process**
Maximilian Schaper
DWD

11:20 – 11:40 **Testing the influence of wind turbines on weather radars by generating virtual Doppler-RCS signatures**
Marc Schneebeli, Andreas Leuenberger
Palindrome Remote Sensing

11:40 – 12:00 **Wind Turbine Clutter detection in real-time Weather Radar Signals, developments for the DWD C-Band Weather Radar Network**
Simon Gerhards*, Patrick Tracksdorf[+]
GAMIC GmbH, DWD[+]*

12:00 – 12:20 **Insights into wind turbine reflectivity and radar cross-section (RCS) and their variability using X-band weather radar observations**
Martin Lainer*, Jordi Figueras i Ventura*, Zaira Schauwecker*, Marco Gabella*, Montserrat F.-Bolaños[+], Reto Pauli[x], Jacopo Grazioli*
MeteoSwiss, [+]armasuisse, [x]Swiss Military Aviation Authority

(In blue online presentations)

12:20 – 14:00 LUNCH BREAK

Session 4: Hardware monitoring and maintenance

14:00 – 14:20 **Comparison of three methods used for radar reflectivity calibration**
Tom Nicolau, Nan Yu, Jean Millet
Météo-France

14:20 – 14:40 **Mitigation of the ZDR Bias Temperature Dependence**
Frank Gekat, Markus Hille, Markus Krings
LEONARDO Germany GmbH

14:40 – 15:00 **Trying to understand the antenna pointing variability at X-band**
Béatrice Fradon
Météo-France

15:00 – 15:30 COFFEE BREAK

Session 5: Reflectivity calibration and monitoring procedures

15:30 – 15:50 **Monitoring of radar reflectivity for operational S-band weather radar network**
Jeong-Eun Lee, Soohyun Kwon, Geun-Hyeok Ryu, and Sung-Hwa Jung
WRC, KMA

15:50 – 16:10 **Monitoring Z calibration to 0.5dB using a co-located disdrometer and very high resolution gauges**
Anthony Illingworth, Robert Thompson
University of Reading, UK

16:10 – 16:30 **Benefits of automated receiver reflectivity calibration monitoring**
Timothy Darlington
Met Office

Session 6: Poster session

16:30 – 17:30 Ice breaker/Poster session

Thursday, 18 November 2021

Session 7: Phase measurements

09:00 – 09:25 **On the use of unique targets for assessing and monitoring the accuracy and stability of phase measurement and dual-polarization measurables: the example of two Bright Scatterers complemented by a Mountainous Scatterer**
Marco Gabella, Marco Boscacci
MeteoSwiss

09:25 – 09:50 **Installation and adjustment of a phase shifter at the DWD Hohenpeißenberg research radar**
Michael Frech, Bertram Lange, Mathias Gergely, Maximilian Schaper
DWD

09:50 – 10:15 **Measurements of the radar differential phases upon transmission and reception on WSR-88Ds**
Valery Melnikov
National Severe Storms Laboratory

10:15 – 11:00 COFFEE BREAK

(In blue online presentations)

Session 8: Reflectivity and ZDR calibration and monitoring procedures

11:00 – 11:20 **Offset correction on radar differential reflectivity using quasi-vertical profiles**

Daniel Sanchez-Rivas, Miguel Rico-Ramirez

Department of Civil Engineering , University of Bristol, UK

11:20 – 11:40 **Z and ZDR calibration using natural target and self-consistency methods**

Jacques Testud, Erwan le Bouar

NOVIMET

11:40 – 12:00 **ZDR Calibrations and Monitoring – ECCC's new S-Band Radars**

Stephen Holden, Daniel Michelson, Sudesh Boodoo, Norman Donaldson, Peter Rodriguez, Qian Li, Peter Leibiuk

Environment & Climate Change Canada

12:00 – 12:20 **Weather Radar Calibration, Recent progress and sharing experiences calibrating, shipborne, spaceborne and ground based systems**

Chandra V Chandrasekar

Colorado State University

12:20 – 14:00 **LUNCH BREAK**

Session 9: Cost and benefits of SSPA radar systems

14:00 – 14:20 **The characteristics of observation using solid-state dual-polarization radar**

Sumida Yasuhiko

JMA

14:20 – 14:40 **Overview of solid-state weather radar and related operational experience**

Soshi Okamoto

JMA

14:40 – 15:00 **Calibration Of Reflectivity And Differential Reflectivity From Sspa X-Band Weather Radar**

Jeong-Eun Lee, Soohyun Kwon, Geun-Hyeok Ryu, and Sung-Hwa Jung

WRC, KMA

15:00 – 15:20 **Reflectivity calibration of complex waveforms with Vaisala WRS400 X-band weather radar**

Pekka Puhakka

Vaisala Oyj

15:20 – 16:00 **COFFEE BREAK**

Session 10: Monitoring challenges

16:00 – 16:20 **Evaluation of DWD radar calibration based on collocated spectral polarimetric observations from W-band cloud radar**

Alexander Myagkov*, Michael Frech[+], Mathias Gergely[+], Thomas Rose*

**Radiometer Physics GmbH*, [+]*DWD*

16:20 – 16:40 **Characterization of background noise during dry and wet radome conditions**

Philipp Schmid

MeteoSwiss

16:40 – 17:00 **Electrical and Sun calibration: what to trust when they disagree?**

Marco Gabella, Maurizio Sartori, Marco Boscacci, Urs Germann

MeteoSwiss

17:00 – 17:45 **Homage to Asko Huuskonen**

20:00 CONFERENCE DINNER

(In blue online presentations)

Friday, 19th November 2021

Session 11: Data quality of weather radar networks and products

09:00 – 09:20 **Long-term evaluation of the Météo-France QPE product**
Nicolas Gaussiat
Météo-France

09:20 – 09:40 **The interaction of data quality monitoring and operational surveillance of weather radar networks**
Hassan Al Sakka, André Weipert
Leonardo Germany GmbH

09:40 – 10:00 **The Argentinian Meteorological Radar: Solar Calibration and Monitoring**
Federico Renolfi, Roberto Costantini, Daniel Vela Diaz
INVAP S.E.

10:00 – 10:30 **COFFEE BREAK**

Session 12: Summary of workshop and discussion

10:30 – 12:00 Summary and discussion
12:00   END OF CONFERENCE

Posters

Hardware monitoring and maintenance:

1. Update on Monitoring and Calibration of Slovak Weather Radar Network
Luboslav Okon
Slovak Hydrometeorological Institute

2. Application of OPENCV in radar system monitoring
Sun-Jin Mo, Ji-Young Gu, Geun-Hyeok Ryu
WRC, KMA

3. Informing calibration with drones and UAVs (withdrawn)
Thomas Chen
Academy for Mathematics, Science, and Engineering

Standard Z and ZDR monitoring procedures:

4. Feasibility analysis of monitoring a C-band weather radar reflectivity calibration using a K-band Doppler radar profiler
A Garcia-Benadi*, J. Bech*, M Udina*, P Altube[+], F Fabro[+]
University of Barcelona, Meteorological Service of Catalonia[+]*

5. Using Data-Based Calibrations to Harmonize the Swedish Weather Radar Network
Richard Stedronsky
EEC

(In blue online presentations)

Commercial and non-commercial monitoring software:

6. Pieuvre
Isabelle Sanchez, Tom Nicolau
Météo-France

7. The use of Pyrad for data quality monitoring
Daniel Wolfensberger*, Jordi Figueras i Ventura[+]
*MeteoSwiss, [+]Météo-France

8. Monitoring with Grafana
Jan Petersen
DWD

9. Development of integrated and easy-to-understand radar monitoring system
Jinwoo Park, Sun-Jin Mo, Ji-Young Gu, Geun-Hyeok Ryu
Weather Radar Center of the Korea Meteorological Administration

Costs and benefits of SSPA:

10. Comparison between SSPA and Magnetron X-band radars in maintenance field
Sun-Jin Mo, Ji-Young Gu, Geun-Hyeok Ryu
WRC, KMA

11. Comparisons Solid-State C-Band and Klystron S-Band Weather Radar Observations over the Southeastern United Stated
Richard Stedronsky
EEC

Monitoring of threats to radar networks:

12. High temporal resolution polarimetric signatures of a peculiar Bright Scatterer: an (almost) steady Wind Turbine observed with a fixed-pointing antenna
Marco Gabella, Martin Lainer, Jacopo Grazioli
MeteoSwiss

(In blue online presentations)