

Towards a GRUAN MWR product

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ACTIVITIES

- **GRUAN MWR Program Guide**
- **TOPROF**
- **GAIA-CLIM**

GRUAN MWR Program Guide

STATUS:

- Following the GRUAN Guide (GCOS-171)
- First draft delivered (15 April 2016)

- **GRUAN MWR Program Guide TD-N.1.0**
 1. Introduction
 2. Instrumentation
 3. Reference Measurements
 4. Measurement Uncertainty
 5. Measurement Scheduling
 6. Data Management
 7. Post-processing Analysis and Feedback
 8. Quality Management
 9. Site Assessment and Certification
 - Appendix 1 - Acronyms
 - Appendix 2 - Examples of MWR lv1 and lv2 data files
 - References



GRUAN MWR Program Guide

- **V1.0 addresses all sections**
 - but it's only a first draft (by no means complete)
- **V1.0 is a living document**
 - continuous updates following TOPROF/GAIA-CLIM activities



TOPROF

- EU COST Action (ES1303)
 - TOPROF: Towards operational ground based profiling with ceilometers, doppler lidars and microwave radiometers for improving weather forecasts
- Contribution to MWR Guide
 - Review best practices for MWR operations
 - Provide protocols for calibration and maintainance
 - Investigate calibration characterization
 - repeatability, stability, and uncertainty
- Two field experiments:
 - Joint Calibration Experiments (J-CAL) and J-CAL2
 - Reporting on calibration best practices are ongoing



GAIA-CLIM

- EU Horizon 2020 Project
 - GAIA-CLIM: Gap Analysis for Integrated Atmospheric ECV CLimate Monitoring
 - Task 2.1.2: Temperature and H₂O profiles measured by microwave radiometers
- Contribution to MWR Guide
 - Contribute to the Gaps Assessment
 - Draft the MWR measurement model diagram



Gaps Assessment and Impacts Document (GAID)

MWR contribute to the GAIA-CLIM GAID

- G2.13: Missing MW standards maintained by Metrological Institute

NIST

- G2.14: Missing the uncertainty associated with MW absorption models used in MWR retrievals

GAIA

- G2.15: Lack of unified tools for automated MWR data quality control
- G2.16: Missing agreement on calibration best practices and instrument error characterization
- G2.17: Lack of a common effort in homogenization of retrieval methods

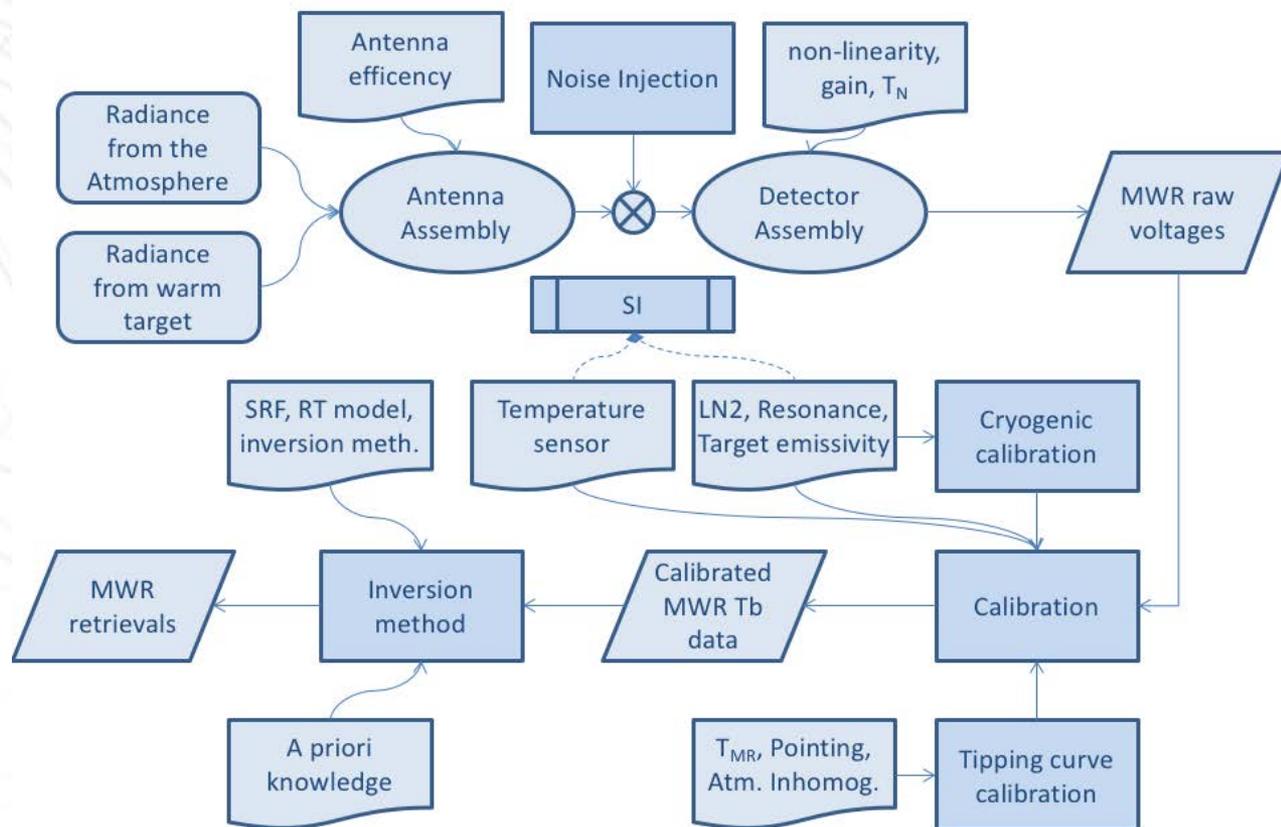
TOPROF

MWR measurement model diagram

A visual sketch of the processing steps leading to a product and its traceability chain

- It helps understanding all the uncertainty contributions to be considered

MWR measurement: Metrological Model Chain



SI-traceability of MWR products

What's missing for full SI-traceability?

1. MW standards maintained by International Measurement Institute (e.g. calibration targets)
 - NIST is working on this development
2. Certified internal temperature sensors
 - Manufacturers should provide certifications
3. Assessment of radiative transfer model uncertainties
 - GAIA-CLIM shall provide useful information



Summary and conclusions

- First draft of MWR Program Guide has been delivered
 - GRUAN MWR Program Guide TD-N.1.0
- MWR uncertainty needs to be worked out properly
 - GAIA-CLIM & TOPROF shall provide useful information
- MWR traceability needs a breakthrough
 - NIST is working on that

Thank you very much for your attention!

