# Overview of MesoVICT activities and literature

Mesoscale Verification Inter-Comparison over Complex Terrain

**Scientific committee:**
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**Manfred Dorninger (Univ. Vienna)**
**Eric Gilleland (NCAR)**
**Barb G. Brown (NCAR)**
**Beth E. Ebert (BoM)**
**Barbara Casati (Env. Canada)**
**Laurence J. Wilson (Env. Canada)**

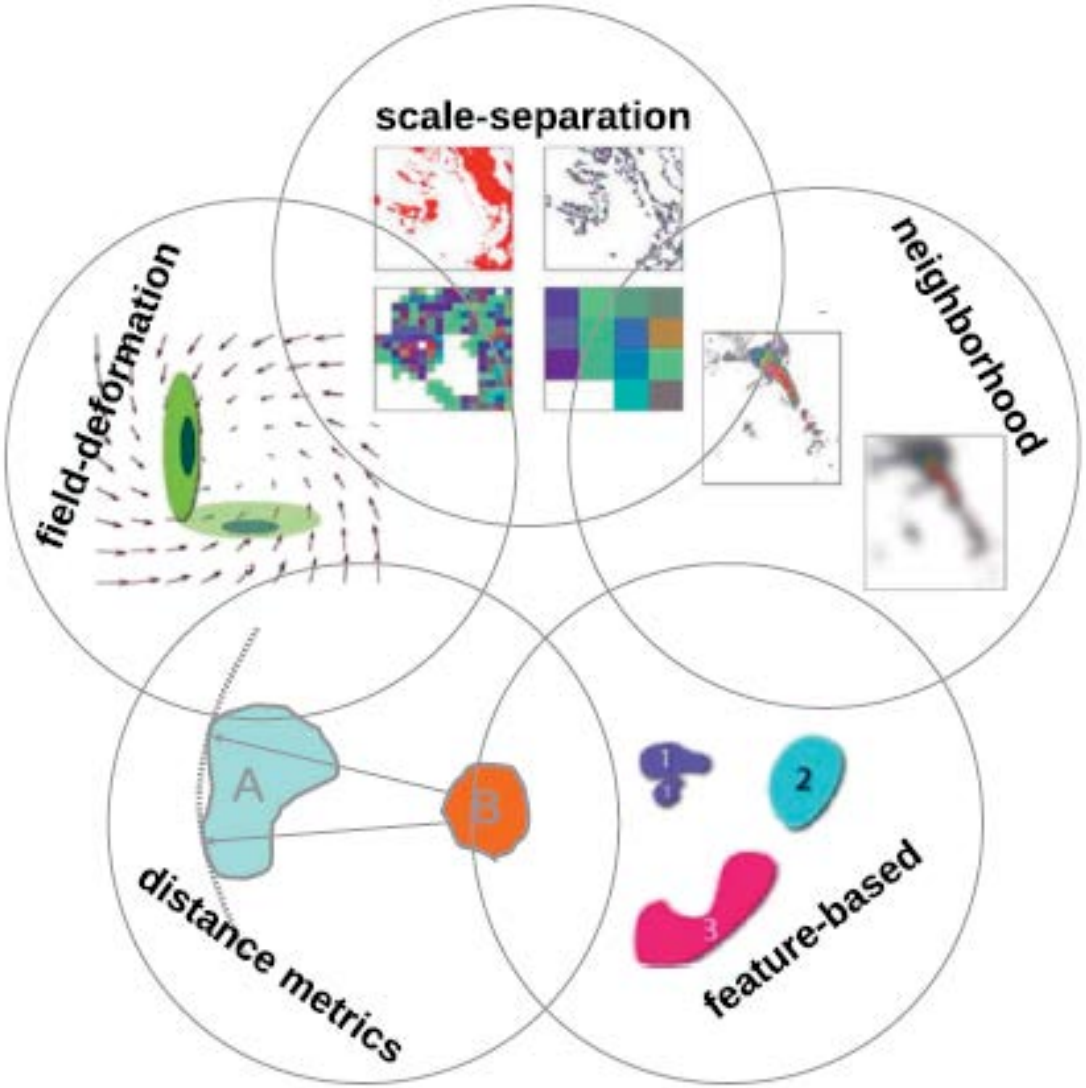
Large parts of presented material are taken from Dorninger et al,. BAMS, 2018

# MesoVICT in a nutshell:

MesoVICT focuses on the application, capability, and enhancement of **spatial verification methods** as applied to **deterministic and ensemble forecasts** of **precipitation, wind, and temperature over complex terrain** and includes **observation uncertainty** assessment.

MesoVICT as follow-up of the first ICP.
http://www.ral.ucar.edu/projects/icp/index.html

# Spatial verification methods



# MesoVICT scientific questions

1) What is the ability of the method to verify forecasts of variables other than precipitation (e.g., wind)?

2) How can the method be adapted to evaluate ensemble forecasts?

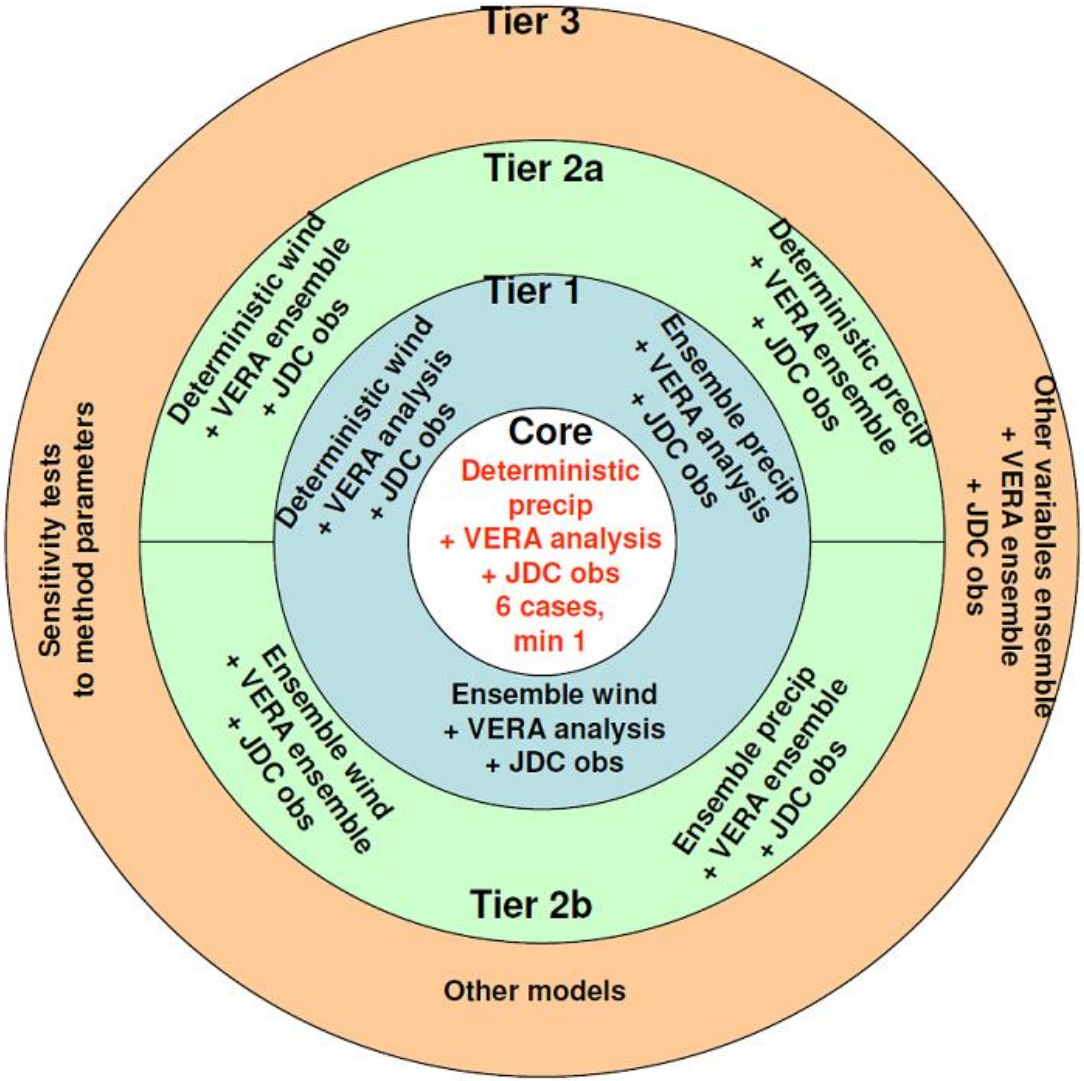
3) Does the method show unusual behavior in complex terrain, and how should results be interpreted given the challenges of forecasting in complex terrain?

4) What is the sensitivity of existing spatial verification methods to their own specific tuning parameters, the domain size, interpolation, and re-gridding?

5) Can the method be used fairly to compare the performance of high-resolution and coarser-resolution forecasts?

6) Can the method account, or be adapted to account, for analysis or observation uncertainty?

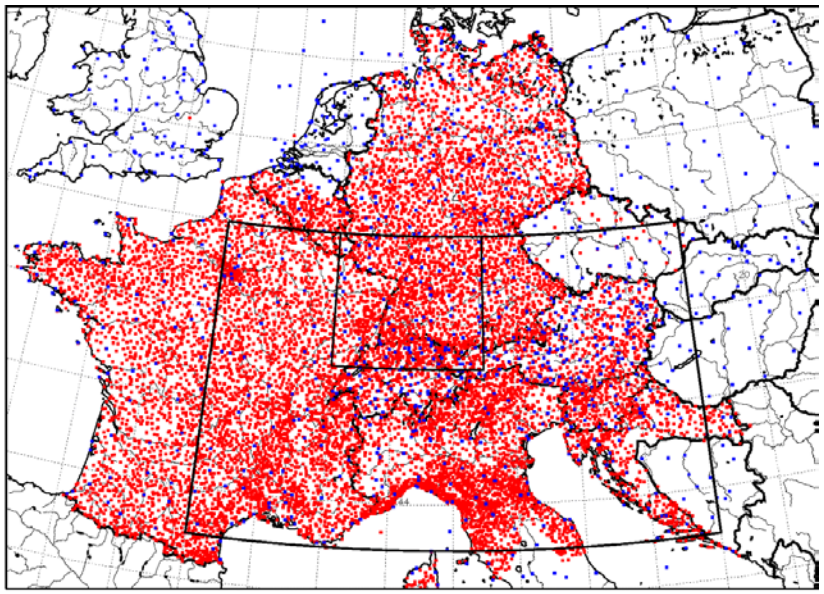
# MesoVICT experimental set-up

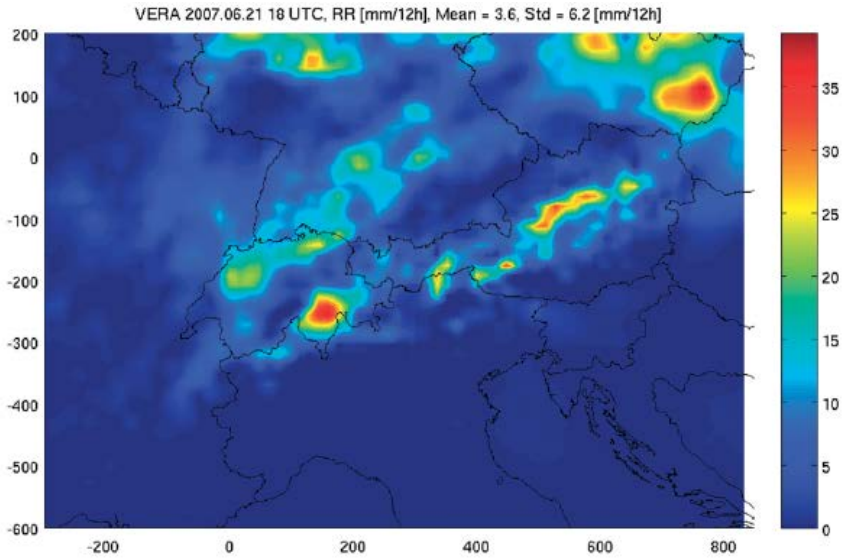


# MesoVICT Data

**Observational data:**
JDC (Joint D-PHASE-COPS ) data set

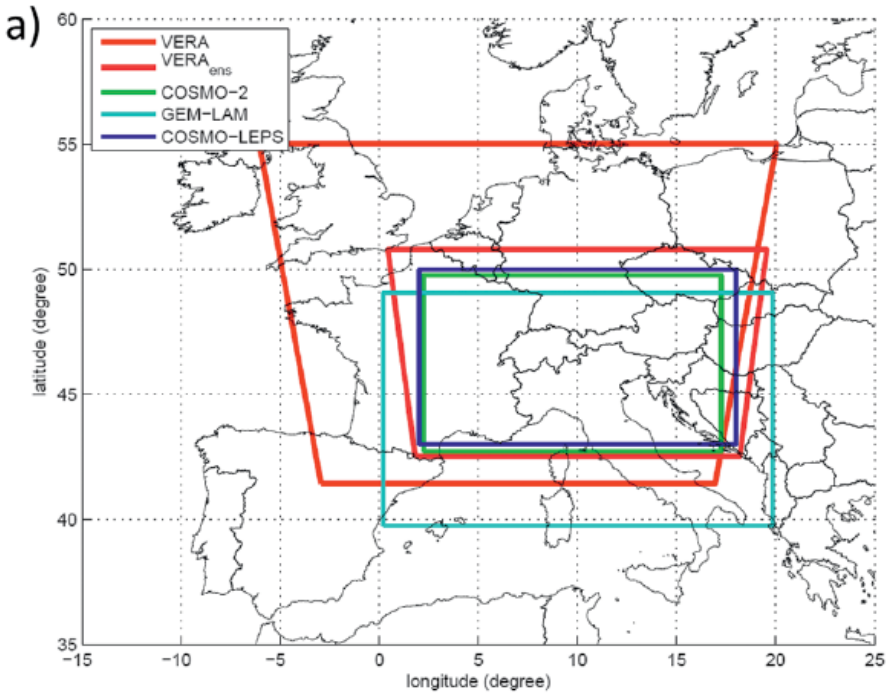
**(Ensemble) Analysis data:**
VERA (Vienna Enhanced Resolution Analysis)



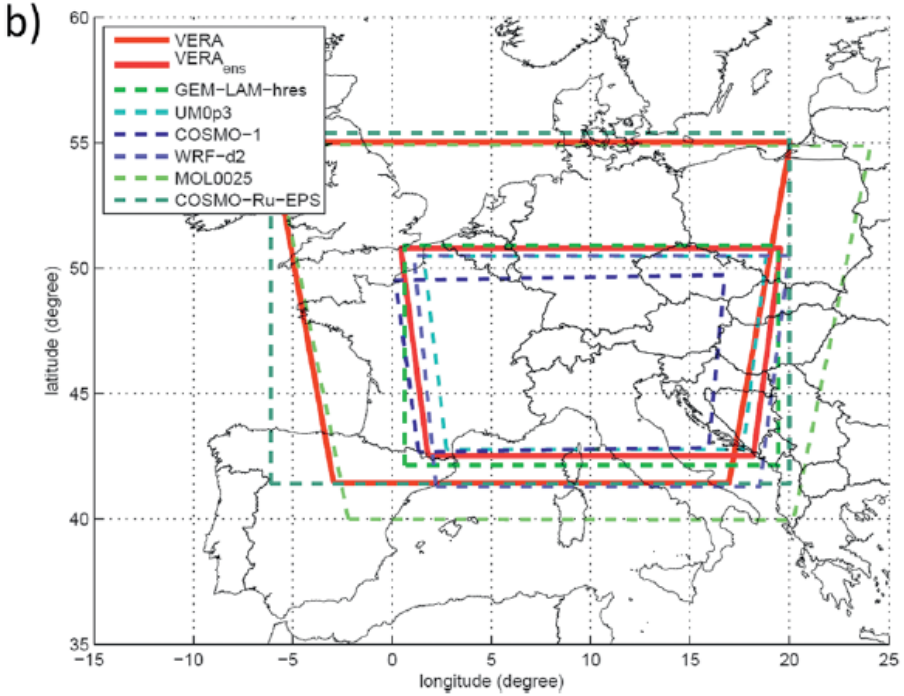


# MesoVICT Data

**Model data (D-PHASE):**




**Model data (model re-runs):**



# MesoVICT Participants

ISPRA, Italy, Stefano Mariani et al.: CRA, BOLAM, MOLOCH reruns

ARPA-ER, Italy, Andrea Montani et al.: DIST, COSMO-LEPS reruns.

COSMO Priority project: INSPECT, A . Bundel, F. Gofa et al.

CETEMPS, Italy, R. Ferretti et al.: WRF-CETEMPS reruns

UK MetOffice, UK, M. Mittermaier et al.: model re-runs, neighbourhood method, FSS

University of Bonn, Germany, P. Friederichs et al.: probabilistic forecasts and observation uncertainty, image warping and wavelet analysis

NCAR, USA, E Gilleland et al.: testing and refining the software SpatialVx; website, geometric case studies.

Environment Canada, Canada, B. Casati: model re-runs, intensity-scale skill score,

University of Ljubljana, G. Skok: FSS adapted for wind

University of Vienna, M. Dorninger, Simon Kloiber: VERA and JDC data, VERA ensemble, observation uncertainty

# MesoVICT Activities

## Conferences, meetings, workshops

| | | | |
|---|---|---|---|
| 13th EMS/11th ECAM | Reading, UK | 9-13 Sep 2013 | initiation of the project |
| 1st MesoVICT workshop (kick-off) | Vienna, Austria | 2-3 Oct 2014 | develop the program |
| 15th EMS/12th ECAM | Sofia, Bulgaria | 7-11 Sep 2015 | MesoVICT session |
| 16th EMS/11th ECAC | Trieste, Italy | 12-16 Sep 2016 | MesoVICT session |
| 2nd MesoVICT workshop | Bologna, Italy | 21-23 Sep 2016 | intermediate workshop |
| 7th International Verification Methods Workshop | Berlin, Germany | 3-11 May 2017 | MesoVICT exercises & MesoVICT talks |
| EMS annual meeting | Budapest, Hungary | 3-7 Sep 2018 | MesoVICT talks |
| MesoVICT final workshop | Vienna, Austria | 8-9 July 2019 | resume |

## Seminar

From February 2018 to January 2019 monthly webinars (except summer holiday season) with presentations and discussions of results

# MesoVICT Literature

## Special collection …

…still open for Journals of AMS

## White literature:


Dorninger, M., E. Gilleland, B. Casati, M.P. Mittermaier, E.E. Ebert, B.G. Brown, and L.J. Wilson, 2018: The Setup of the MesoVICT Project. *Bull. Amer. Meteor. Soc.*, **99**, 1887–1906, https://doi.org/10.1175/BAMS-D-17-0164.1

Gilleland, E., 2017: A New Characterization within the Spatial Verification Framework for False Alarms, Misses, and Overall Patterns. *Wea. Forecasting,* **32**, 187–198, https://doi.org/10.1175/WAF-D-16-0134.1

Skok, G. and V. Hladnik, 2018: Verification of Gridded Wind Forecasts in Complex Alpine Terrain: A New Wind Verification Methodology Based on the Neighborhood Approach. *Mon. Wea. Rev.,* **146**, 63–75, https://doi.org/10.1175/MWR-D-16-0471.1

# MesoVICT Literature

## White papers cont'd

Radanovics, S., J. Vidal, and E. Sauquet, 2018: Spatial Verification of Ensemble Precipitation: An Ensemble Version of SAL. *Wea. Forecasting*, **33**, 1001–1020, https://doi.org/10.1175/WAF-D-17-0162.1

Mariani S., and M. Casaioli, 2018: Effects of model domain extent and horizontal grid size on contiguous rain area (CRA) analysis: A MesoVICT study. *Meteorol. Z.* , **27**, 481-502, DOI: 10.1127/metz/2018/0897

Han, F. and I. Szunyogh, 2018: A Technique for the Verification of Precipitation Forecasts and Its Application to a Problem of Predictability *Mon. Wea. Rev.,* **146**, 1303–1318, https://doi.org/10.1175/MWR-D-17-0040.1

F. Gofa et al., 2017: Identifying the skill of higher resolution forecasts precipitation forecasts with neighborhood verification techniques. In: Perspective of Atmo. Sciences, Eds.: Karacostas et al., Springer.

# MesoVICT Literature

## Grey literature:

Dorninger, M., M. P. Mittermaier, E. Gilleland, E. E. Ebert, B. G. Brown, and L. J. Wilson, 2013: *MesoVICT: Mesoscale Verification Inter-Comparison over Complex Terrain*. NCAR Technical Note NCAR/TN-505+STR, 23 pp, doi:10.5065/D6416V21.

Bachelor Thesis:
Geiß S., 2015: Comparison of spatial verification forecasts. Bach. Thesis, LMU Munich, 43pp.

Master Thesis:
Kloiber S., 2017: Verification in complex terrain with ensemble analysis. Master Thesis, Univ. Vienna, 66pp.
D'Alessandro, Daniele,2016: From the traditional verification approach to the spatial methods: a study of applicability of the SAL metric in the framework of the WMO project MesoVICT. *University of Bologna.*

# MesoVICT Literature

## Other literature and presentations:

*Lots of presentations at EMS 2015, 2016 and 2018, 7th Internat'l Verification Methods workshop in Berlin, 1st and 2nd MesoVICT workshops in Vienna and Bologna.*

***Other (planned) publications and presentations ?***