Status of data assimilation in Slovenia - 2018

Benedikt Strajnar

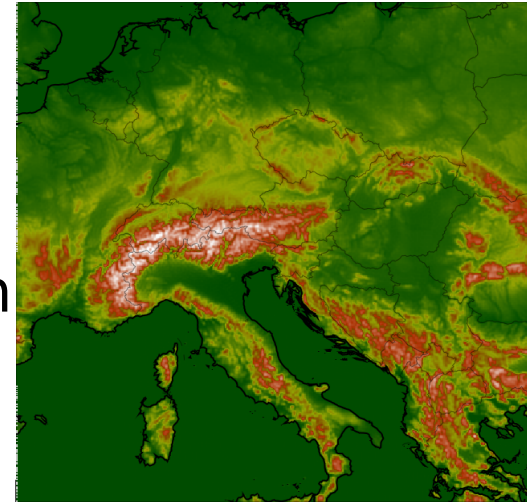DHMZ   SHMÜ   ARSO METEO Slovenia   OMSZ   ZAMG   ROMANIA ANM

Status overview

Model: ALARO-v1B cy40t1
- 4.4 km, 87L, 432x432
- Timestep: 180 s
- Coupling: ECMWF (6h lag), 1h/3h
- Space-consistent LBC, no init.
- 72h/36h forecasts

Upper-air DA: 3h 3D-Var, dsc. ens B,
- SYNOP (u,v,t,rh), AMDAR (u,v,q), Mode-S EHS/MRAR (u,v), GEOWIND/HRWIND(u,v), TEMP(u,v,t,q), PROFILER (u,v), SEVIRI(2,3), AMSU-A(5-12), MHS(3-5), IASI(~35),ASCAT(u,v)
- VarBC (rad.), REDNMC=1.6, SIGMAO_COEF=0.9

Surface DA:
- OI-CANARI, SYNOP(t,rh)
- SST analysis from ECMWF

Towards radar DA

## **Development of HOOF – the Python tool for homogenization of Opera OIFS dataset**

- See separate presentation
- Enables:
  - Homogeneous and prescribed structure
  - Relevant (meta)data only
  - Splitting of files in individual measurements
  - Defining or adjusting metadata
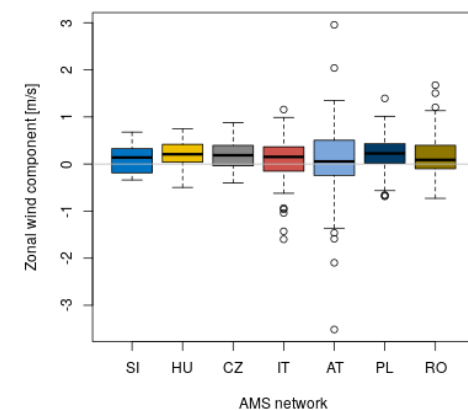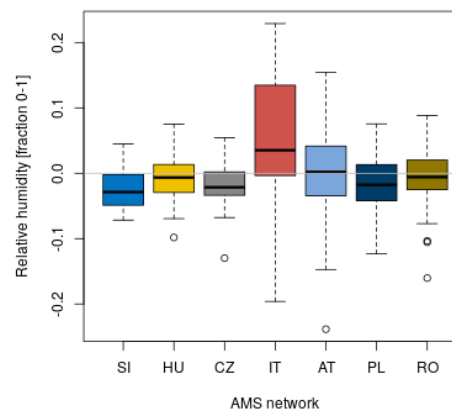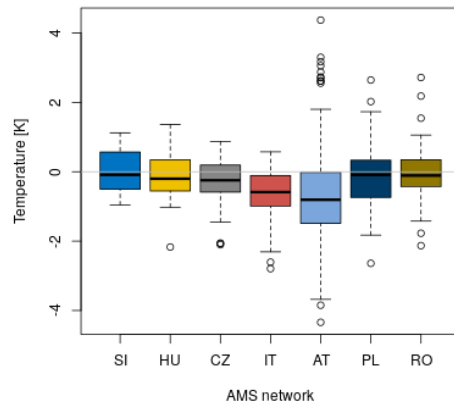- Enables reading of the complete OIFS dataset and storing to ODB (Bator cy43)

Monitoring of AWS data

- 1 month monitoring of all OPLACE AWS + Italian stations. Blacklisting needed?
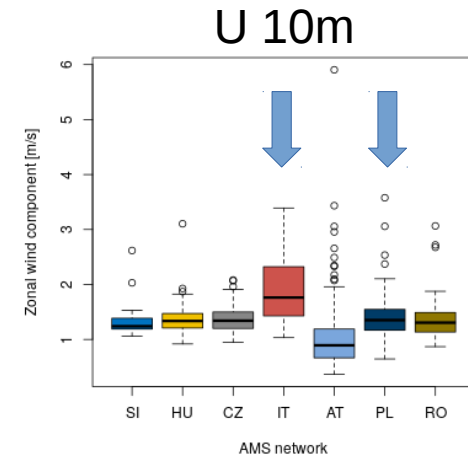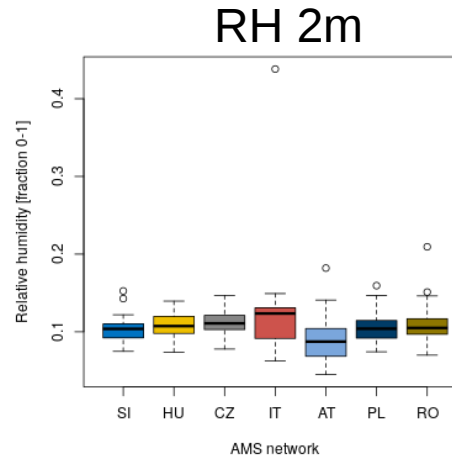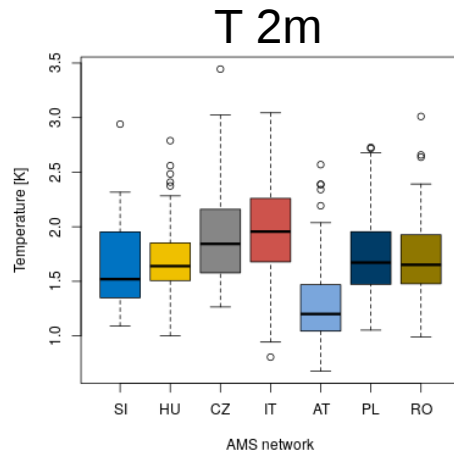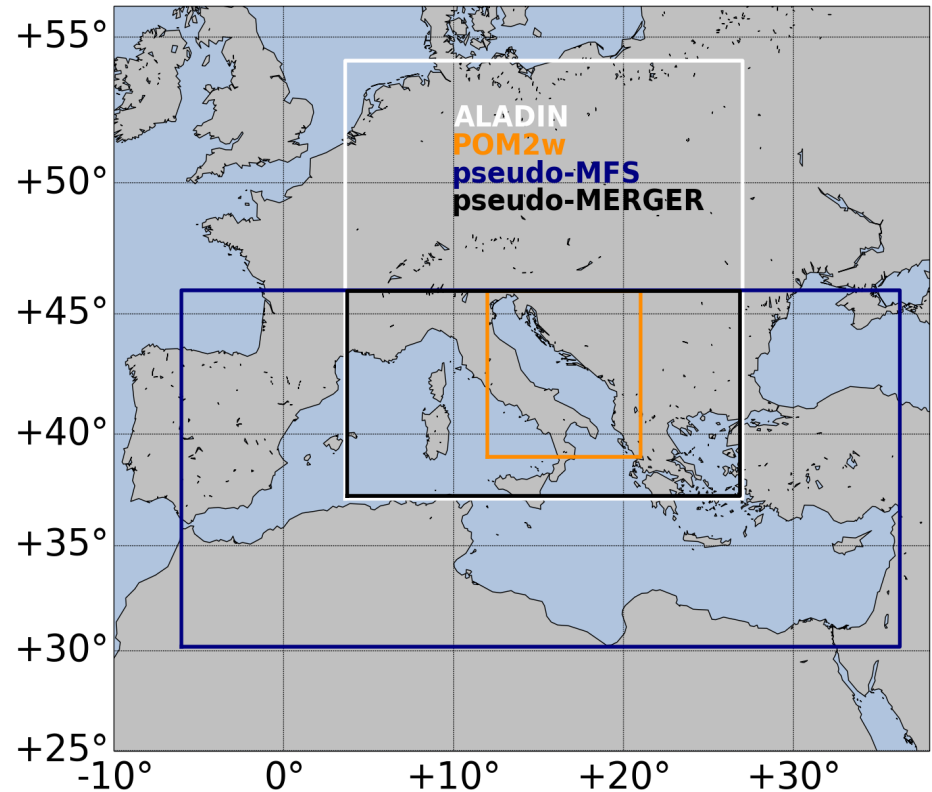
Impact of SST and 2-way coupling

- ALADIN 2w coupled to ocean model POM over tha Adratic Sea

- SST provided by POM, fluxes provided from ALADIN

- 2w coupling compared to using static SST

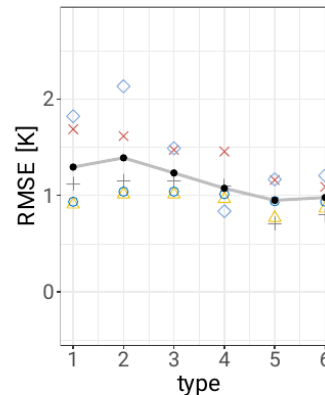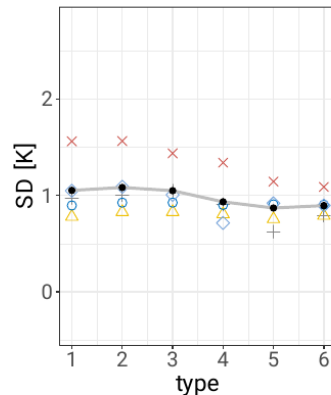- Quasi-weak ocean atmosphere coupling

Impact of SST and 2-way coupling on SST

- Quality of SST forecast verified by daily gridded Copernicus satellite observations for 5 extreme weather periods
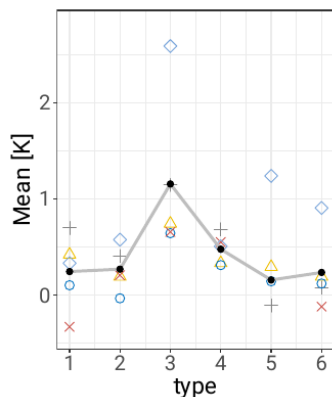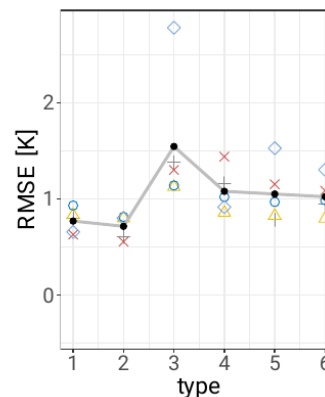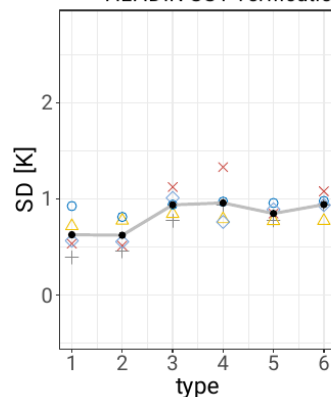
In POM
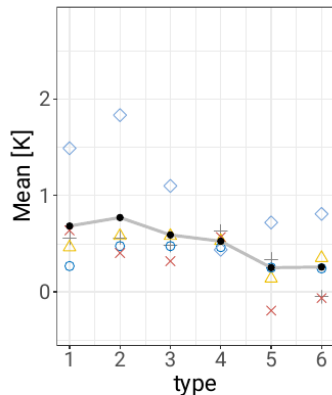
In ALADIN

1: EC/OSTIA
2: MFS
3: 1w POM
4: 1w POM + 2w FC
5: 2w POM + 1w FC
6: 2w POM 2w FC

Impact of SST and 2-way coupling on precipitation

- SST plays a more important role for mesoscale processes during the warm part of the year.
- The high horizontal resolution of SST provided by a regional ocean model does not outperform a static SST initialised from global analysis (ECMWF).
- The two-way coupled runs do not outperform the run using the freshest static SST analysis.
- Impact of applying 2w coupling in forecast of the assimilation cycle before the simulated event is neutral
- 2w coupled experiment performs better than the uncoupled one if SST is provided by the same regional ocean model
- **Data assimilation for the ocean component is necessary in a coupled system.**

Probability of Detection

False Alarm Ratio

Frequency Bias

Equitable Thread Score
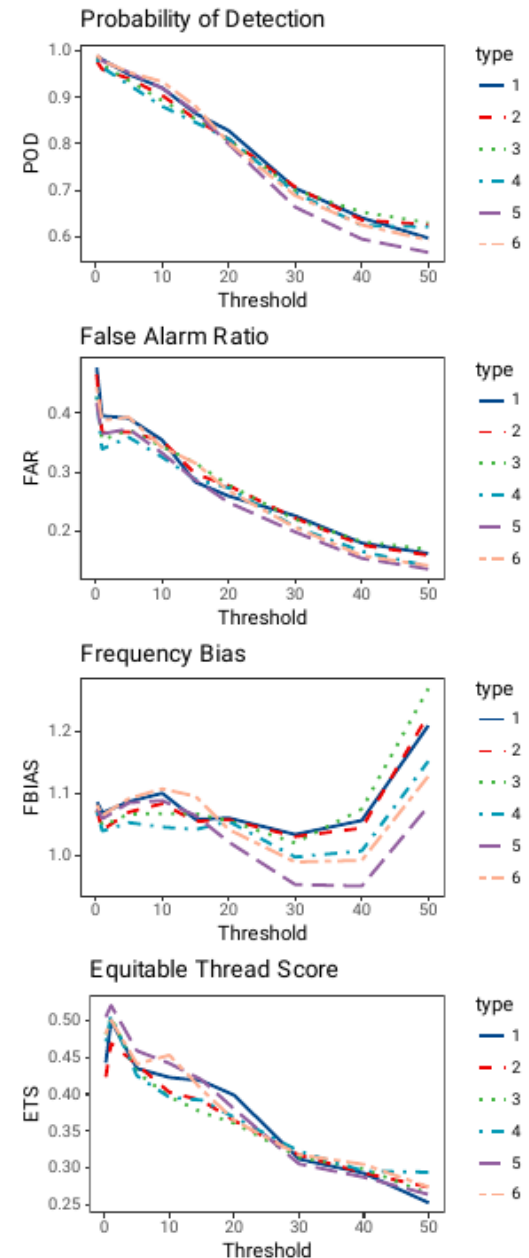
Plans for 2018/2019

- 1.3 km (nowcasting) model domain with data assimilation based on radar data – hourly update plus short range forecast
- 4.4 km EDA to provide flow-dependent bg. error estimate