Posters Session

P. Pottier; All Staff Workshop 2021, video-conference

A-LAEF: from TC2 status to case studies

A-LAEF system

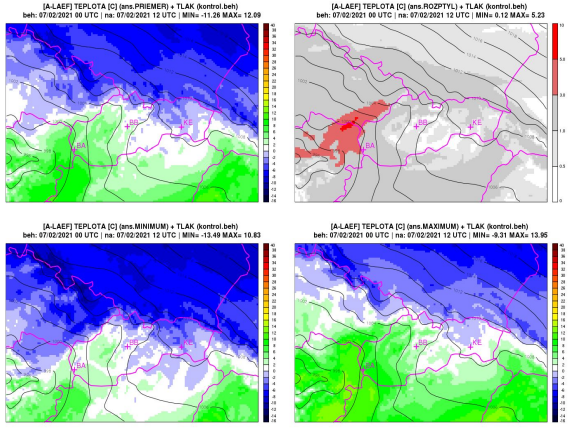
- sequel to former ALADIN-LAEF
- higher spatial and vertical resolution
- more sophisticated perturbation methods
- multi-scale ALARO physics
- completely rebuilt scripting system
- TC2 status since July 2020

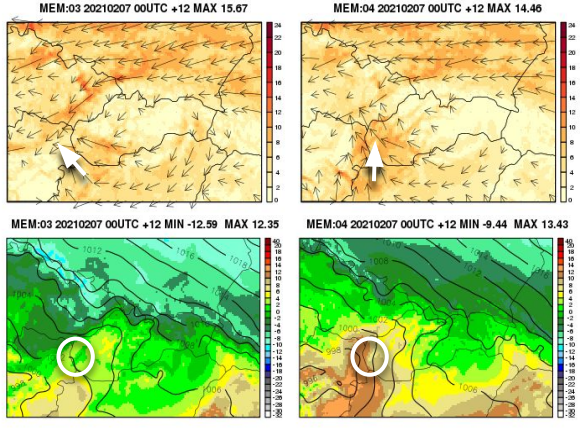
Case studies

- fog situation on Nov 24, 2020
- advection situation on Feb 07, 2021

Conclusions

- added value over the deterministic models
- extreme weather situations well captured
- MP clusters are useful to diagnose model issues





BELLUS Martin

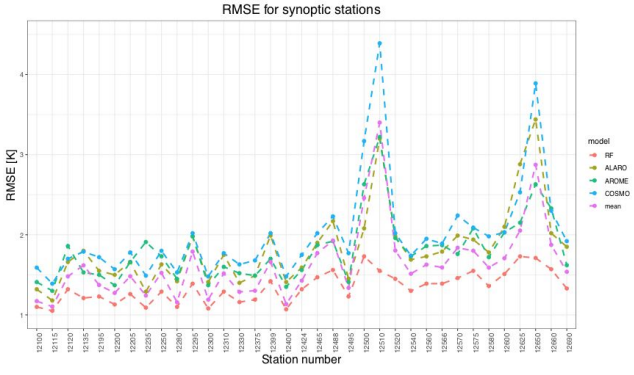
Operational activities in Poland

Operational Forecasts

- No changes from last year, ALARO 4km; AROME 2km.

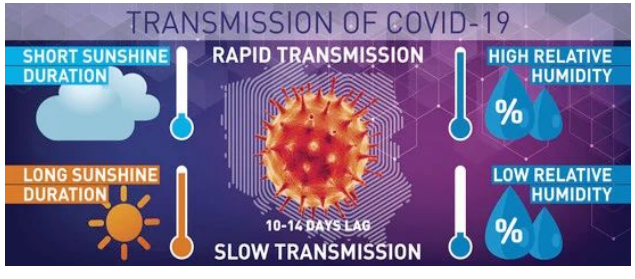
Machine learning post processing of 2m temperature

- ALARO, AROME and COSMO models used to train system based on Random Forest method
- Average reduction of RMSE of 16%



Measuring and forecasting impact of weather on diseases in Poland (new project)

- Just published paper on impact of weather condition on COVID-19 in Poland
- 10 days - characteristic time lag
- high correlation of new cases and deaths with t2m, h2m, sunshine duration; low correlation with mobility.



BOCHENEK Bogdan

ACCORD

NWP Systems at AEMET. Impact of cy43h2.1

Operational suite based on HARMONIE-AROME cy401.1

- SAPP preprocessing for conventional observations
- IASI data in DA
- Parallel suite including Doppler Radar Winds

On-going migration to a new HPC system

- ATOS System based on AMD EPYC procs with 38.840 cores divided in two clusters (increasing the computing capacity by 6 aprox)

E-suite based on cy43h1.1.1 expected to become operational in May 2021

- Overall improvement compared to cy40h1.1 for most variables and seasons
- Examples of scores and impacts shown in the poster

CALVO Javier

NWP Activities at TSMS

Overview NWP Systems

- ALARO (cy40t1_bf7, 4.5 km),
- AROME (cy43t2_bf10, 1.7km),
- AROME-RUC (cy43t2_bf10, 1.7km,IFS coupling)
- A-LAEF usage of post-processing data for Turkish domain

HPC Resource

- 4032 Core, E5-2690v4 Broadwell, 2.6GHz, 192GB DDR4 RAM per node

DAsKIT Activities

- SAPP for pre-processing -> talk of Yelis Cengiz

Verification Scores

- Comparison of ALARO,WRF and IFS

Cycle 43 at Met Eireann

Cycle 43h2.1 operational since 23rd March

- **New IREPS configuration: 1+15 lagged ensemble**
  1+10 at 0000/0600/1200/1800
  1+5 at 0300/0900/1500/2100

- **Migration GRIB1 to GRIB2**

- **Full details and testing of new model configuration: observations, dynamics, microphysics, surface, ...**

NWP activities in Romania

Description of the operational setup

- **transition to cy43t1**

Forecast validation of the new model version

- **objective scores**
- **examples of model behaviour for the precipitation forecast**

CRACIUN Alexandra

NWP activities Belgium

NWP models

- **Operational models: CY43t2**
  - Alaro 4km, 1.3km : dynamical adaptation
  - Arome 1.3km : Surface DA

New Alaro tuning

- **new versions of Alaro 4km and 1.3km (with help from CHMI)**

Data Assimilation (DASKit) activities

- **new scripting system (based on ecflow)**
- **3d-Var tests**

NWP activities @SHMU

NWP systems

- **ALADIN/SHMU:** 4.5 km/L63, ALARO-1vB, CANARI & DF BLENDING, CY43t2bf11 (12/01/2021)
- **ALARO2:** 2 km/L87, ALARO-1vB, DynAdapt., CY43t2bf11
- **A-LAEF** - see its separate poster

R&D highlights

- **BLENDVAR** e-suite: environment & validation
- **Very high resolution** dynamic adaptation experiments
- **SURFEX offline** - testing snow & soils schemes for winter cases
- verification and local QC

New HPC (soon to come)

DERKOVA Maria

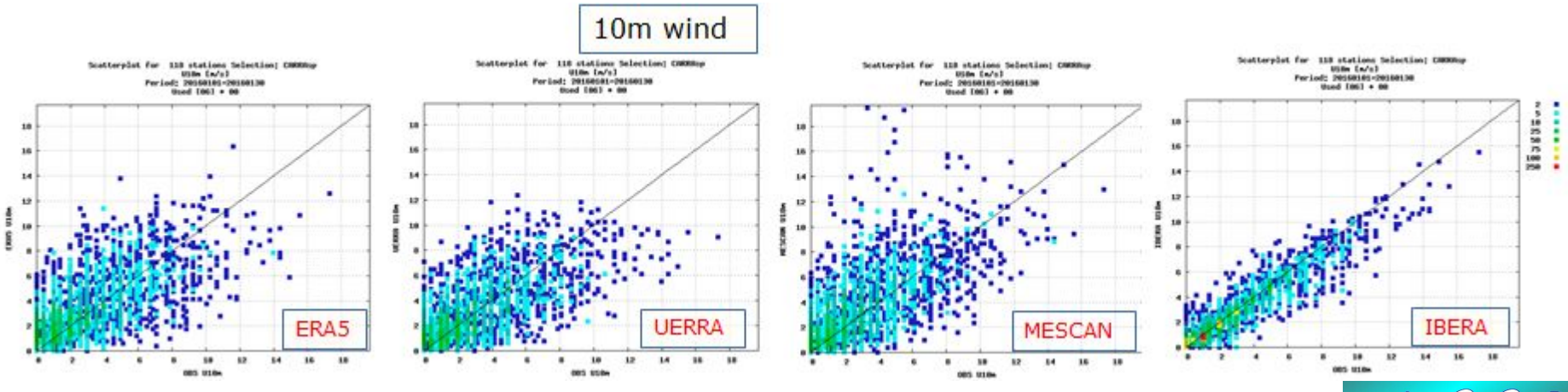
Prototype of a High Resolution Iberian Reanalysis (IBERA)

Motivation: Explore the added value of a High Resolution Reanalysis (2.5km resolution)

Set-up

- Based on HARMONIE-AROME cy40h1
- Similar set-up to the Copernicus Artic Reanalysis but only with conventional observations
- ERA5 boundaries and entering in the Fg through a blending process
- Significant increase of surface observations: AEMET climatological network and obs from networks from other institutions in Spain
- Specific settings to account for regional effects, tuning of background error statistics for upper air (3DVar) and surface analysis (CANARI)
- Enhanced with an off-line surface analysis SPAN improving local effects and adding precipitation and extreme temperature analysis

Results: Clear added value compared to other reanalysis

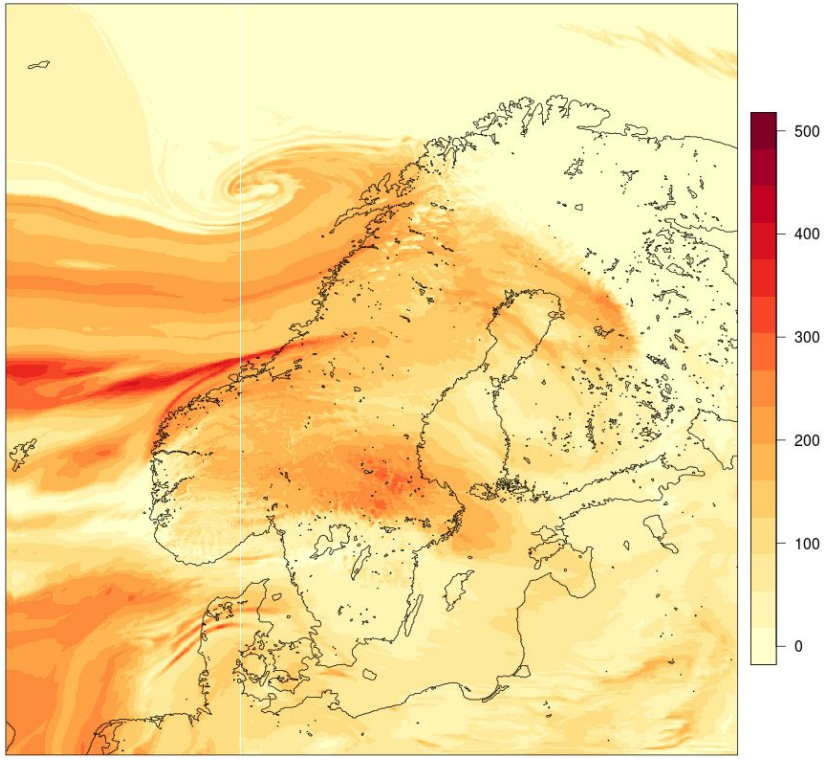


DIEZ Maria

More results of impact of aerosol dataset on precipitation along the Norwegian coast

Precipitation bias in forecasts (dry on coast, wet in mountains)

- Contributing reason: Prescribed **constant** cloud condensation nuclei (CCN) concentrations
- Sensitivity experiments with different CCN conc. show promising results
- Removing artificial border in prescribed CCN conc. over sea-land
- **Near-real-time spatio-temporally varying** CCN conc. from CAMS (Daniel Martín, AEMET) gives best results:
  - Reduced precip. bias, esp. on the coast

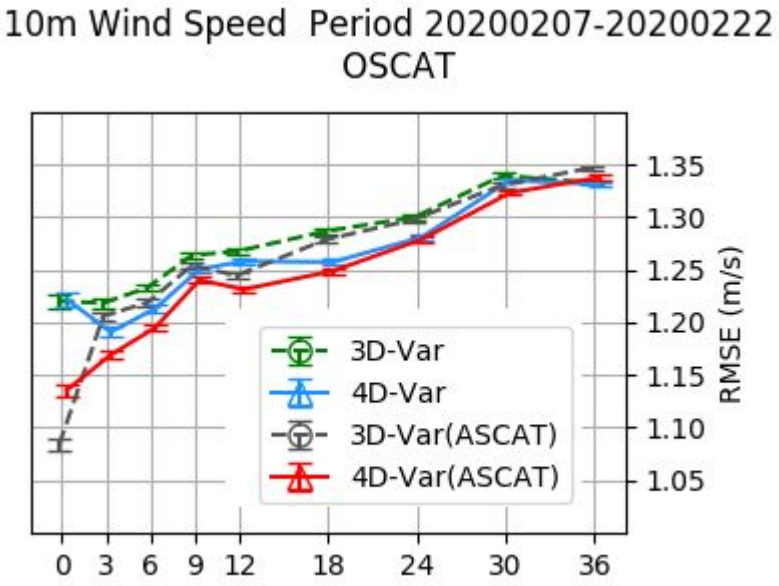


Example of more realistic CCN concentrations (/cm^3) from CAMS from 2020-01-01 18h. Evolving in both space and time.

LANDGREN Oskar

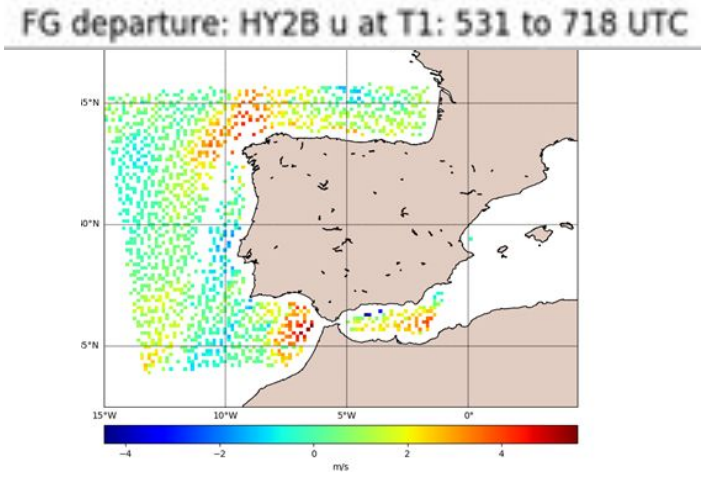
Scatterometer winds assimilation in HARMONIE-AROME for a domain over the Iberian Peninsula

1. **ASCAT winds use in HARMONIE-AROME 4D-Var**
   - **Optimal** in **HARMONIE-AROME 4D-Var**
   - Verification reveals that **4D-Var outperforms 3D-Var**.
   - **Scores are improved for all lead times**.



2. **ATOVS and ASCAT combined use in HARMONIE-AROME**
   - **Improves scores** particularly **in 4D-Var.**

3. **HY-2B successfully tested in CY46- HARMONIE-AROME**
   - **Its use will be further explored.**

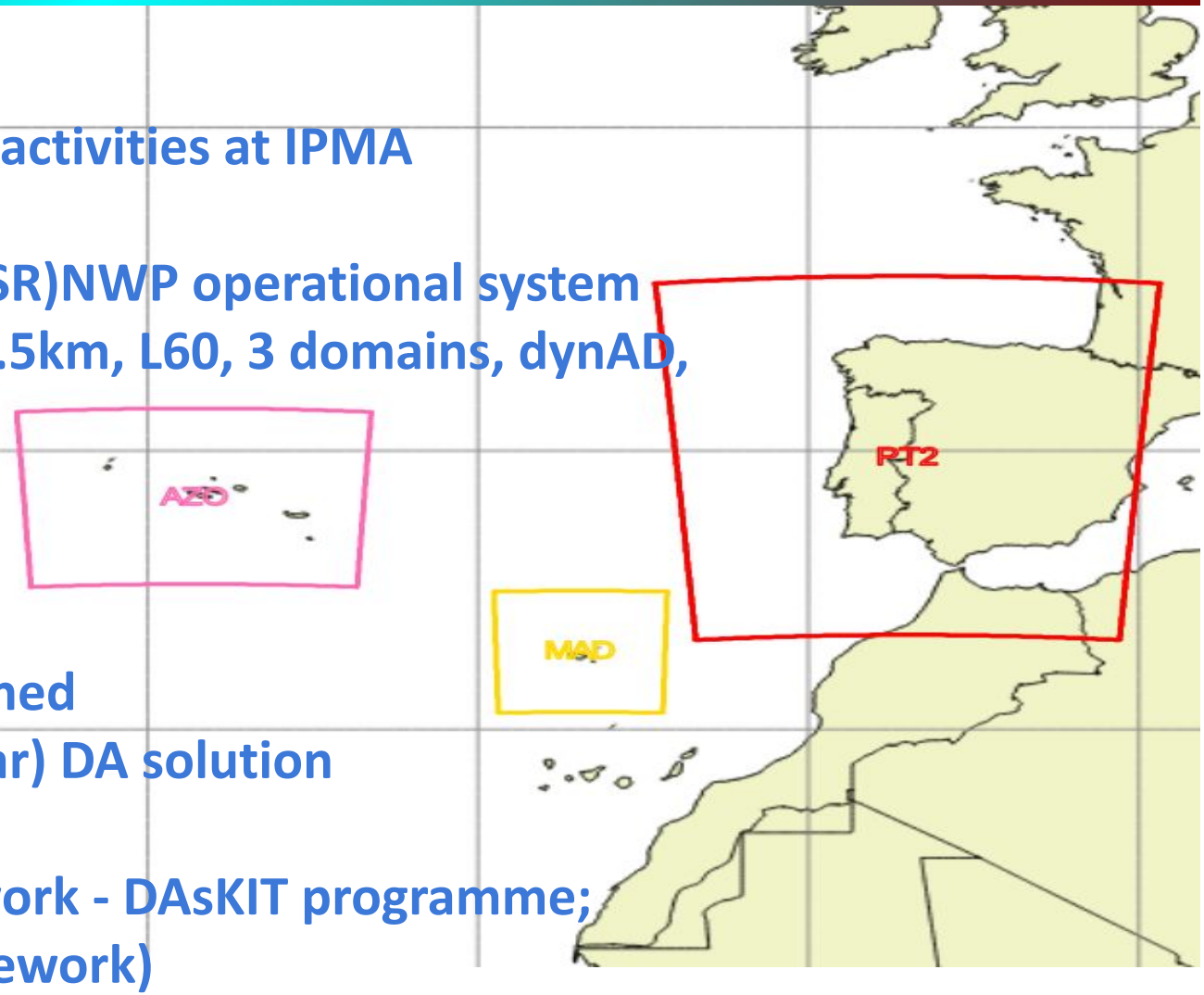


MONTEIRO Isabel, COSTA Vanda and SILVA Fabíola

2021 ACCORD highlights for IPMA, I.P.

1. Summary of (SR)NWP activities at IPMA

2. Description of actual (SR)NWP operational system AROME T-based (CY40), 2.5km, L60, 3 domains, dynAD, surfDA, ARPEGE coupling



3. Effort towards a combined CANARI-OI_MAIN + 3D-Var) DA solution to AROME/PT2 (twofold: AROME framework - DAsKIT programme; HARMONIE-AROME framework)

MONTEIRO Maria

The NWP systems at Météo-France

Switch of operations to Belenos on 2 February 2021

- 2 twin HPC : **ATOS BULL Sequana XH2000**

Global operational NWP systems based on ARPEGE

- ARPEGE **Deterministic,** ARPEGE-**EDA,** ARPEGE-**EPS**

Regional operational NWP systems based on AROME

- **AROME-France Deterministic, AROME Overseas (5 domains), AROME-France-IFS**
- **AROME-France-Nowcasting**
- **AROME-EDA, AROME-EPS**

Operational upgrades

- in operation since 16 Feb 2021: **CY43T2_op8**
- e-suite: **CY46T1_op1**

NWP activities at ARSO (Slovenia)

Upgrade of the HPC system - ~ doubled CPU

NWP system

- ALARO-1vB @ 4.4 km
- ALARO-1vB @ 2.5 km at ECMWF (SEE-MHEWS-A project)
- ALARO-1vB @ 1.3 km for nowcasting (1h RUC, radar reflectivity)

Assimilation of radar reflectivity

Ensemble and AI approach for storm surge modelling

CROCUS snowpack model

PRISTOV Neva

Assimilation of Doppler Radar Radial Winds data in the HARMONIE-AROME model configuration run at AEMET

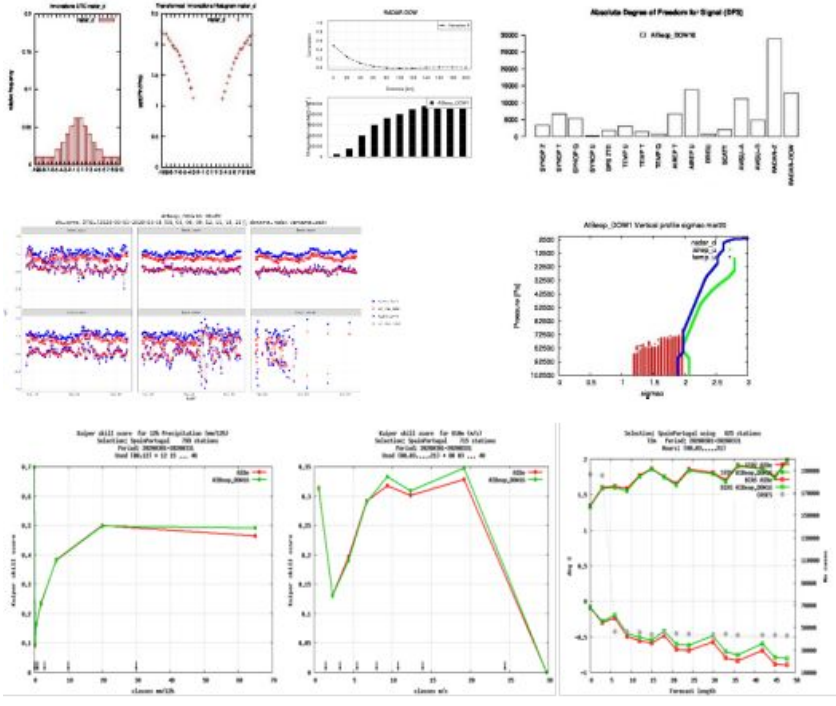
Harmonie-AROME cy40h1.1, 2,5km, 3DVar

- **OPERATIONAL** : conv obs, ATOVS, GNSS ZTD and RADAR Reflectivity (FR,ES,PT)

- **PRELIMINAR:** like CONTROL + DRW (FR,ES) with **default settings.**
  Negative impact, very high innovations

- **REFINED**: like CONTROL + DRW (FR,ES) with **some changes**:
  - **FG check limit** decreased
  - **Thinning distance** increased
  - **Obs error** standard deviation increased

  POSITIVE impact on 10m wind speed and precipitation forecasts in high impact weather conditions.Also on T2m bias.



- Currently there is a Cy40 **parallel run** to the AEMET HARMONIE operational one (that also assimilates IASI radiances) **including Doppler radar radial winds.**

- Further investigation to better understand the source error /New str func etc.

SANCHEZ ARRIOLA Jana & NAVASCUES Beatriz

The NWP activities at Croatian Meteorological and Hydrological Service

NWP system

- ALADIN-HR4 - 4 km, 73 vert. lev.; CANARI+3DVar with 3h cycle, LBCs: IFS (lagged mode), 72h fcst
- ALADIN-HRDA - 2km, 32 vert. lev., 72h fcst., LBCs: ALADIN-HR4, dynamical adaptation mode, 72h fcst
- ALADIN-HR2: x = 2km, 37 vert. lev., SSDFI, 48h fcst. hours, LBCs: ALADIN-HR4, 1 run per day, 48h fcst.

Neighbourhood post-processing (time/space) at point of interest - example of outputs, verification

New source for clay and sand percentage in climate files

Validation of cy43 e-suite; test of precipitation type diagnostics

DA: cycling of GFL fields; adding Jk

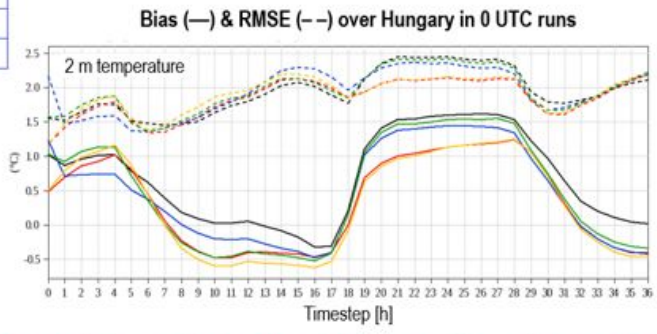
ALADIN-HR2cy43 vs ALADIN-HRDA

New HPC soon

STANESIC Antonio

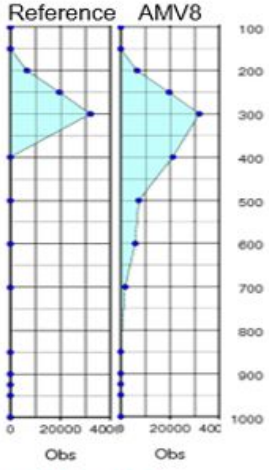
NWP activities at the Hungarian Meteorological Service

Experiment	REF	EXP3
Number of vertical levels	60	90
Canopy	on	off
REDNMC	1.2	1.2
SIGMAO_COEF	0.9	0.9
REDNMC_Q	-	1.67



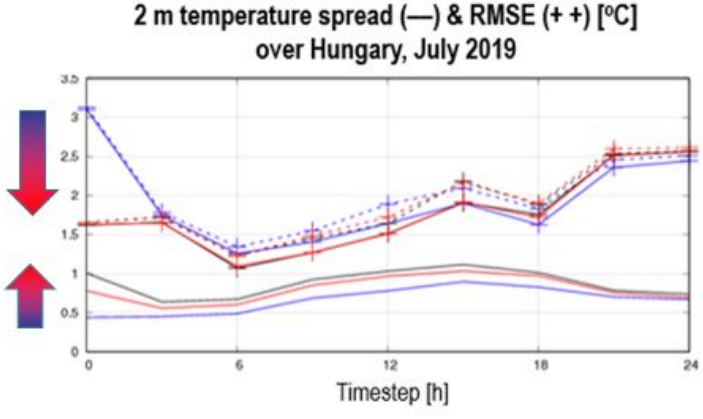
New B-matrix for 90 vertical levels

Setting	Reference	AMV8	AMVA
Quality index < 85 %	inactive	inactive	inactive
Data where p>700 hPa over land	inactive	inactive	active
Data where p<700 hPa for VIS	inactive	inactive	active
Data between 300 and 850 hPa	inactive	active	active
Data where p>400 hPa for WV	inactive	inactive	active

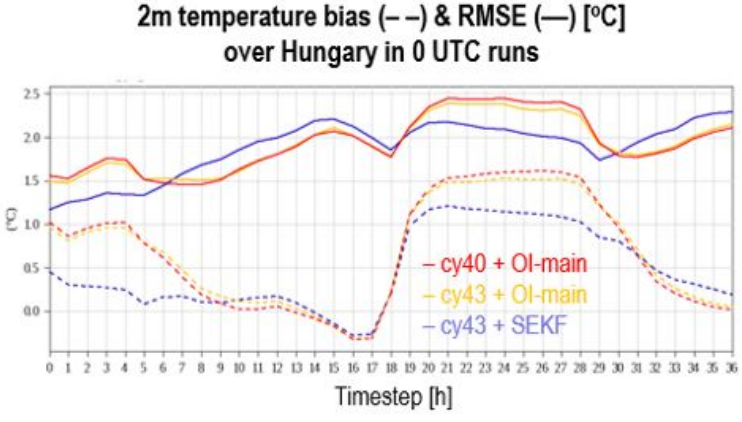


More AMV data with revised blacklisting set-ups

Improved forecasts by EDA in AROME-EPS



Improved night temperature with SEKF wrt. OI-main



SZEPSZO Gabriella

NWP activities at CHMI

NWP system

- ALARO-1vB @ 2.3km

Major operational changes

- Jun 2020 - more observations & tuning of structure functions & update of roughness from more advanced databases
- Nov 2020 - new discretization of TKE & TTE -> talk of J. Masek

Lightning diagnostic in ALARO-1

- code for prognostic graupel validated & diagnostic interfaced
- calibration of model lightning intensity against LINET measurements

New climate project PERUN

- **P**rediction, **E**valuation and **R**esearch for **U**nderstanding **N**ational sensitivity and impacts of drought and climate change for Czechia
- ALARO-1vB climate configuration at convection permitting scales
- porting to the dedicated HPC ongoing

MetCoOp status and plans

MetCoOp EPS (MEPS) current setup

- **Major upgrade to harmonie-43h2.1.1 on March 23**

How MEPS is run (hourly, distributed over 3 HPCs)

- **More about change of schedule Feb. 4, 2020**

Nowcasting

- **Upgraded to harmonie-43h2.1.1 on March 23 as well**
- **Second MNWC version assimilating crowd-sourced (Netatmo) data**

Various plans

- **43h2.2 testing, 4D-Var, B-statistics, SPP, 90 levels, single precision, SAPP, ensemble calibration**

National Poster Austria

Overview NWP systems

- deterministic systems AROME-Aut (2.5km) and nowcasting version AROME-RUC (1.2km)
- LAMEPS C-LAEF (2.5km) -> talk of Clemens Wastl

New observations for Nowcasting (AROME-RUC)

- GNSS ZTD processed from receivers on trains
- Exploring MicrowaveLink data
- Exploring Netatmo data

-> talk of Phillip Scheffknecht

Comparing ForceRestore and Diffusion Soil Schemes

- Goal: Replace current ForceRestore scheme to allow more physical representation and satellite based assimilation
- first promising results with diffusion scheme

WITTMANN Christoph