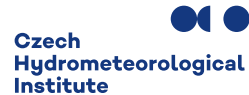


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Limited Area Modeling in Central Europe*



DA status Croatia

Suzana Panežić, Anamarija Zajec, Antonio Stanešić



ARSO METEO
Slovenia

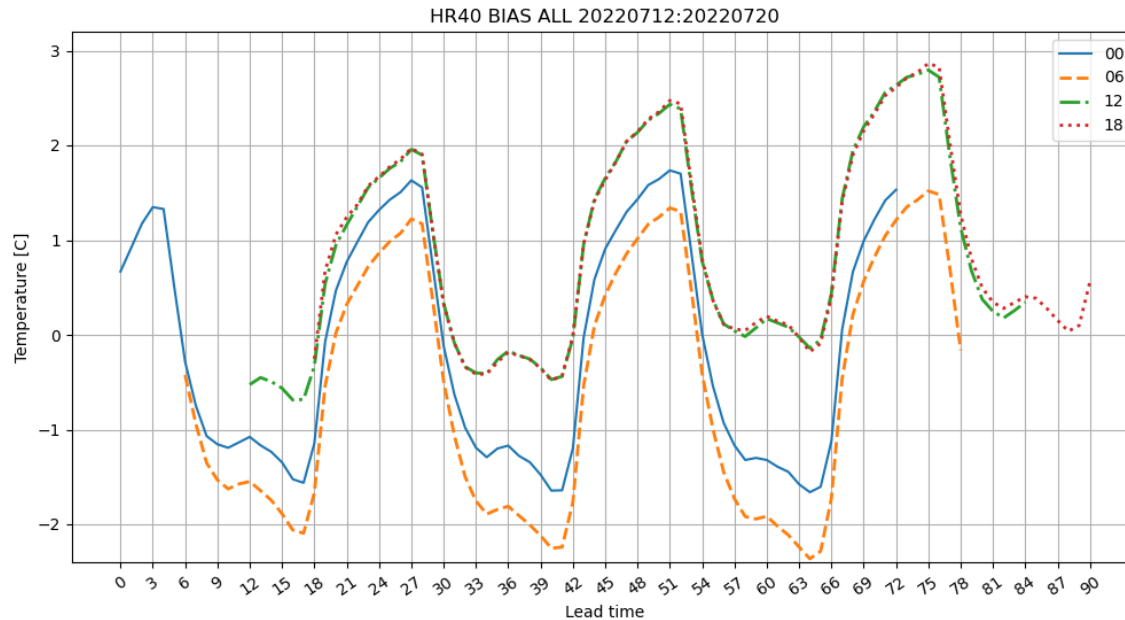
- ▶ Current status
- ▶ Plans 2025

- ▶ From February 2023 DA suite operational on new HPC

model cycle	43t2bf10
domain & vertical levels	480x432, 4.0 km, L73
assimilation cycle	3h
B- matrix	static EDA
coupling	IFS 1h (lagged in oper cycling)
assimilation & initialization	3D-Var + OI, Jk, SCC
observations	SYNOP, AMDAR, MODE-S MRAR CHMI&SI, GEOWIND, TEMP, SEVIRI, OPERA/OIFS reflectivity
observation cut-off time	1.40 h

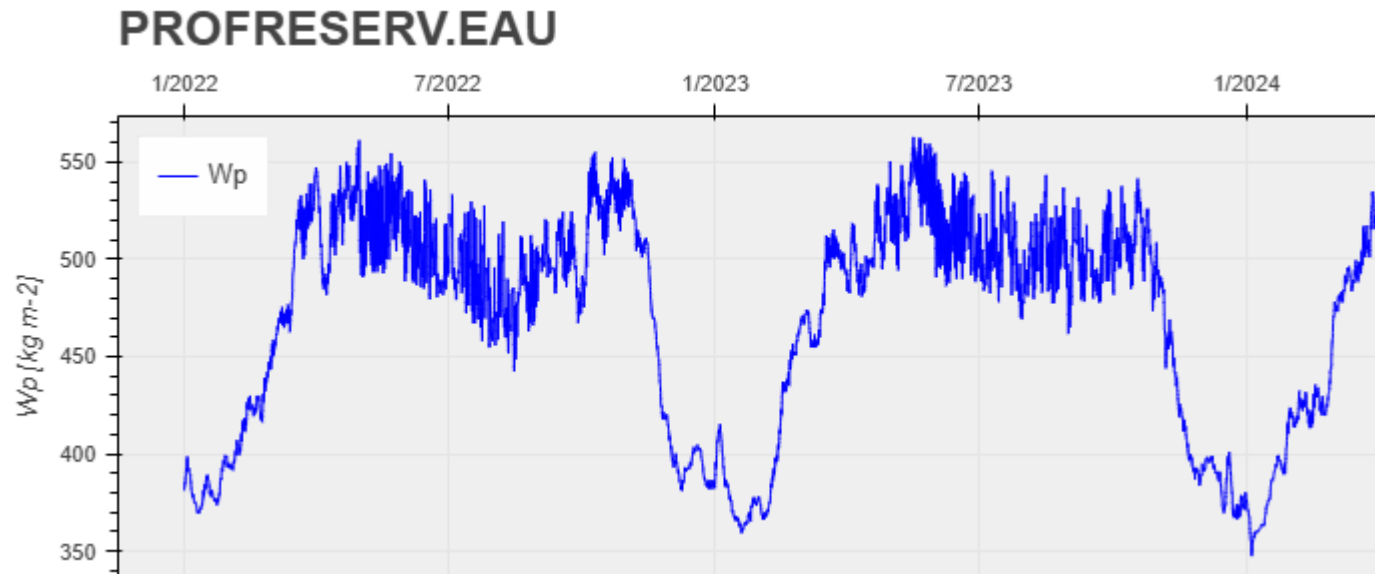
- ▶ Two problems were noticed and connected to SURFACE DA

1) Forecast jumpiness during summer



- ▶ Two problems were noticed and connected to SURFACE DA

2) Unrealistic soil moisture evolution during year



- ▶ Number of experiments were conducted for tuning of CANARI settings (EXP10)
- ▶ Additionally smoothing of Wp fields over last 9 hours was applied by external procedure (v7.9)

Recent updates – CANARI tuning

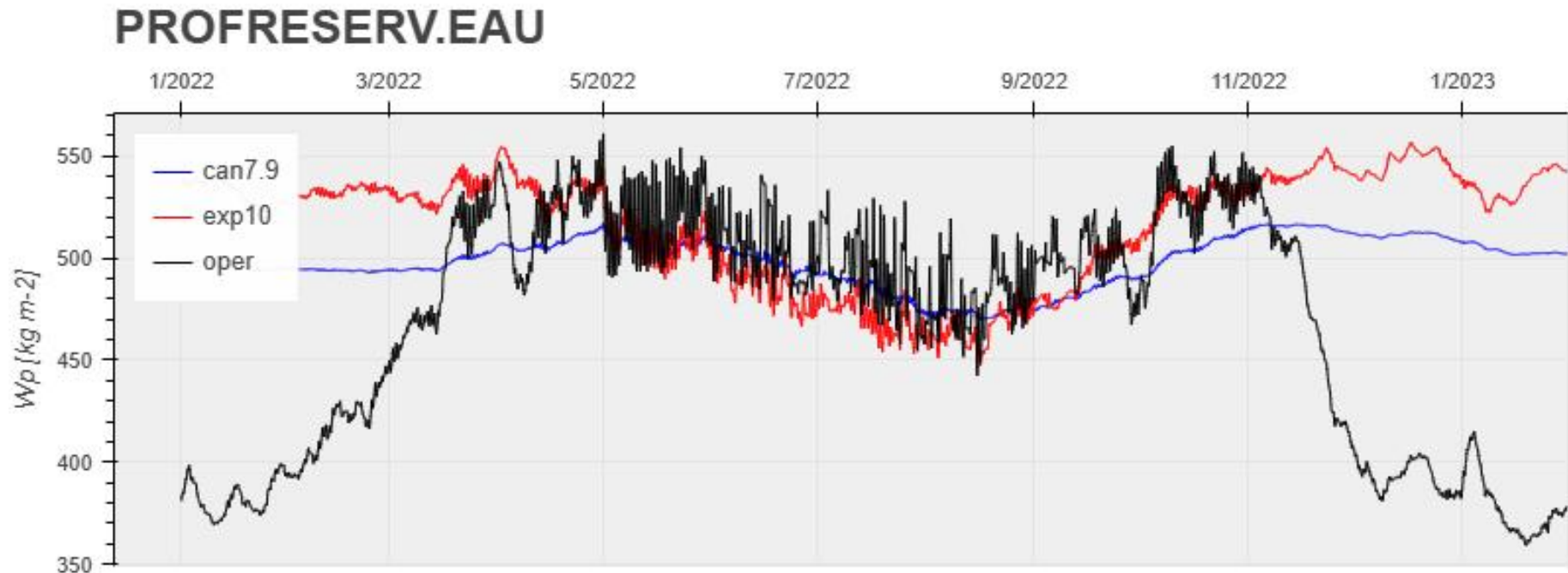
▶ Final settings

SODELX

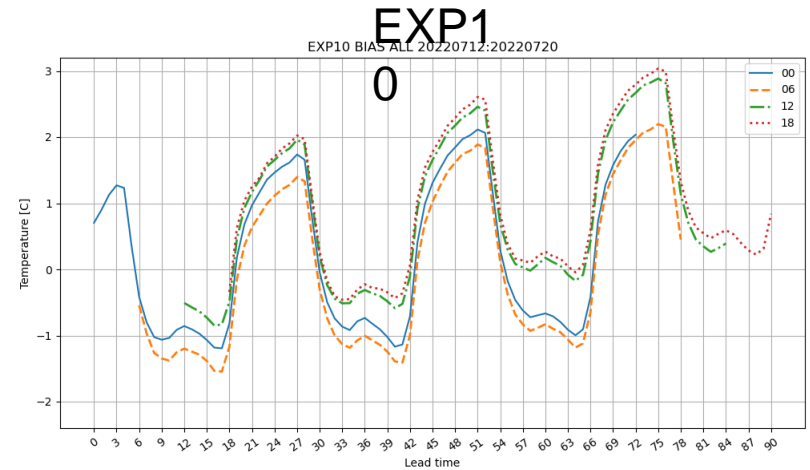
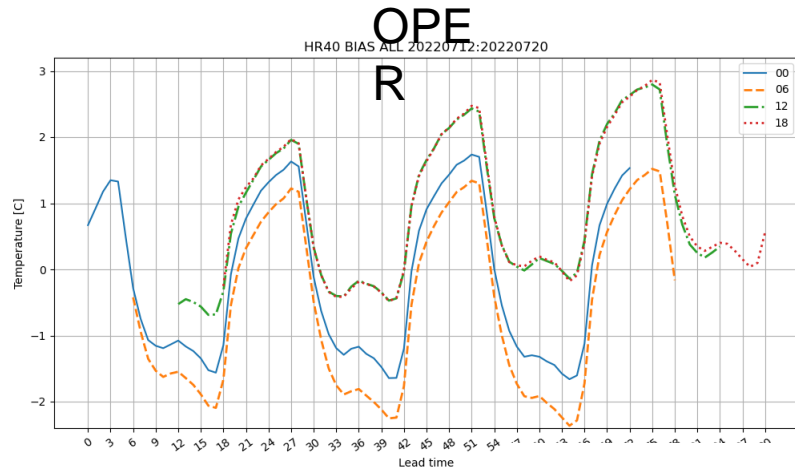
$$T_p^a - T_p^b = \Delta T_{2m} / 2\pi$$

	EXP10	v7.9
ANEBUL		0,45
SPRECIP		5
V10MX		10
SMU0		0
OROLIM		52000
ORODIF		300
RCLIMCA		0,015
MESCAN		F
REF_A_H2		85000
REF_A_T2		80000
REF_S_H2		0,18
REF_S_T2		2,2
SIGH2MO		0,1
SIGT2MO		1
NNEIGW		1
ISBA polinomi		6
SODELX(0)		1
SSODELX(1)		2
L_SM_WP		.T.
ACLS_HS		5

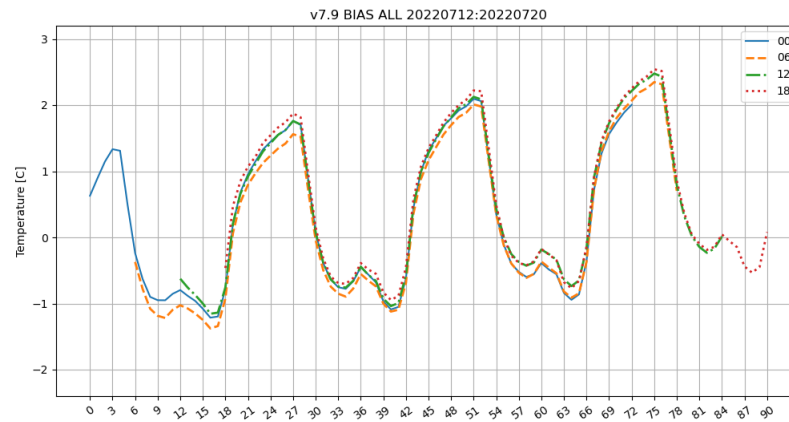
- ▶ Settings obtained from EXP10 correct yearly evolution of W_p



► Smoothing of Wp (v7.9) corrects for jumpiness of forecast

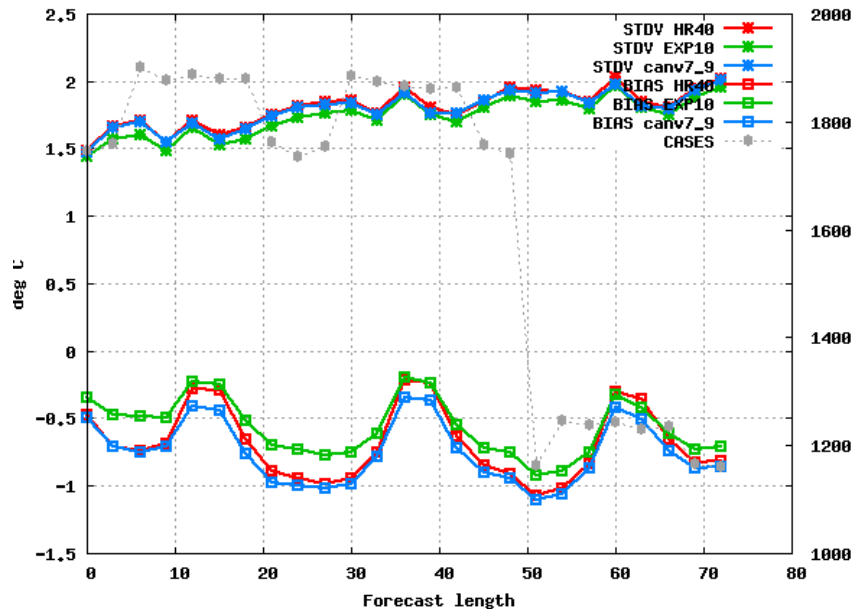


v7.9



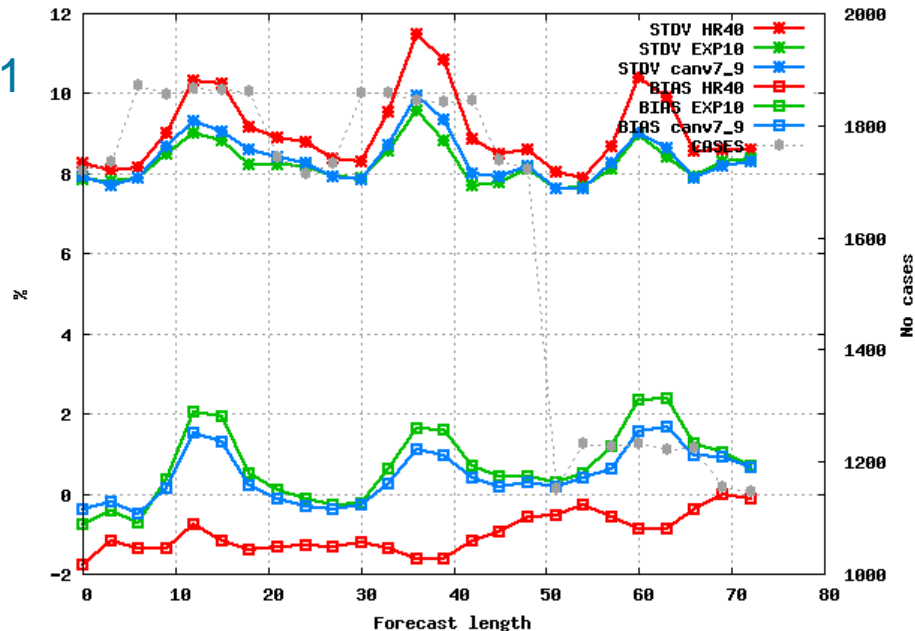
Final results - winter

Selection: ALL using 644 stations
T2m Period: 202212
Hours: {00}

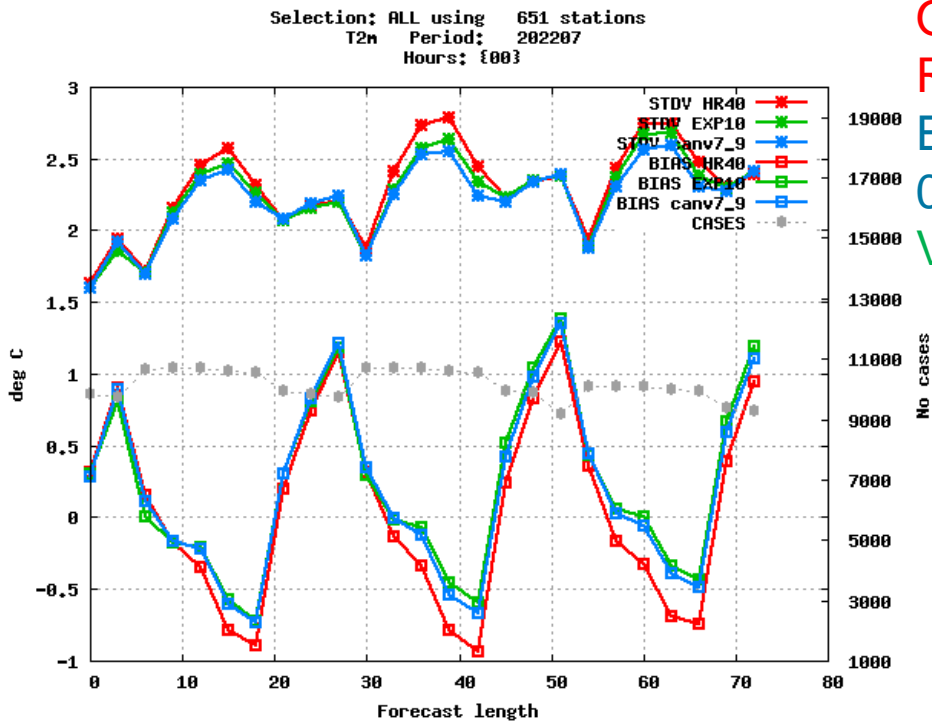


OPe
R
EXP1
0
V7.9

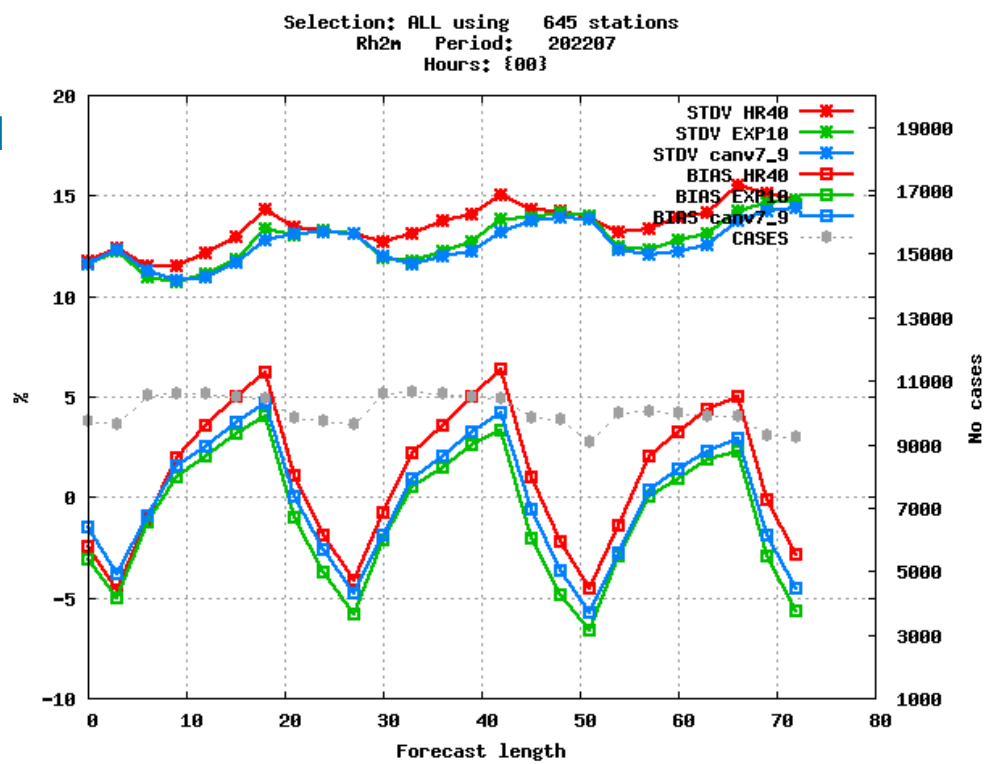
Selection: ALL using 638 stations
Rh2m Period: 202212
Hours: {00}



Final results – summer



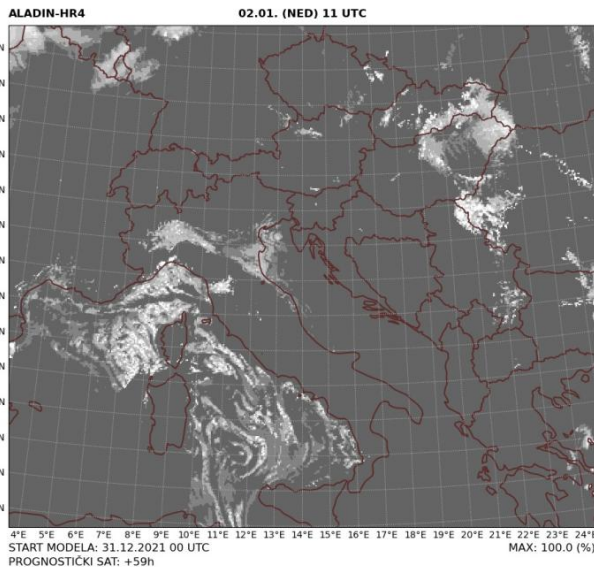
OPE
R
EXP1
0
V7.9



▶ fog

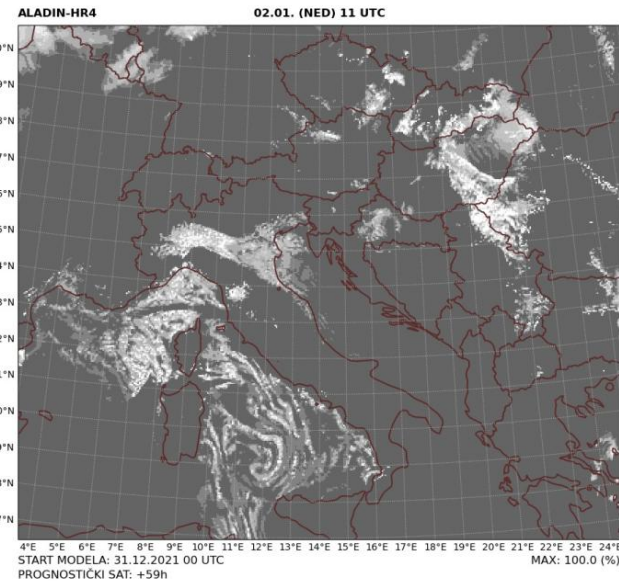


HR40
NISKA NAOBLAKA

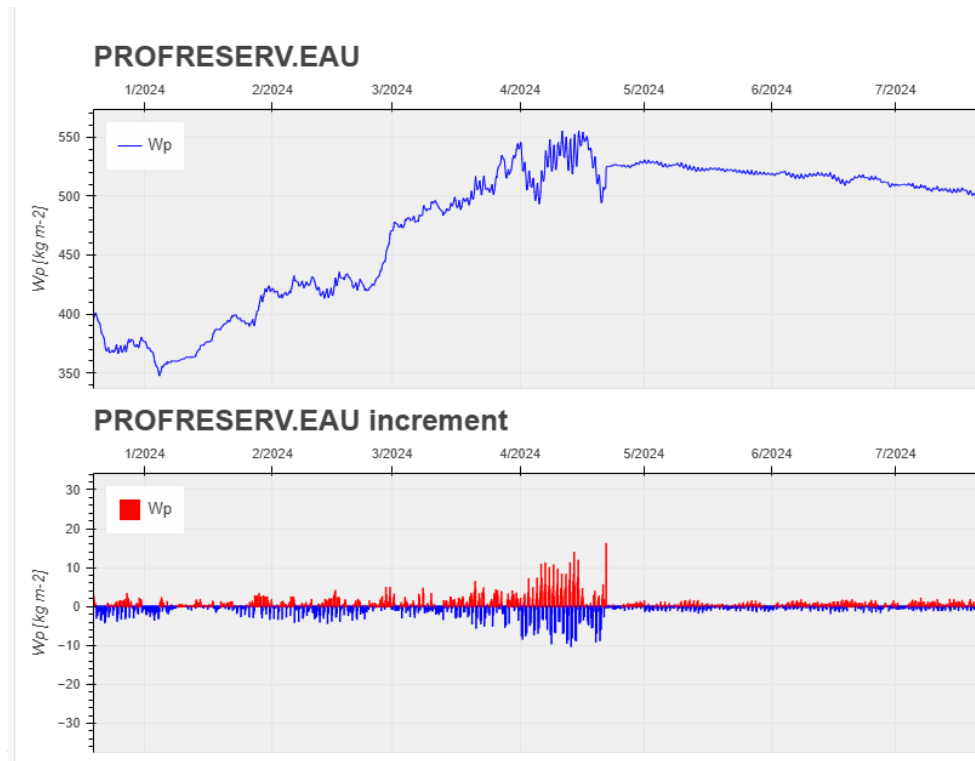


v7.9

NISKA NAOBLAKA

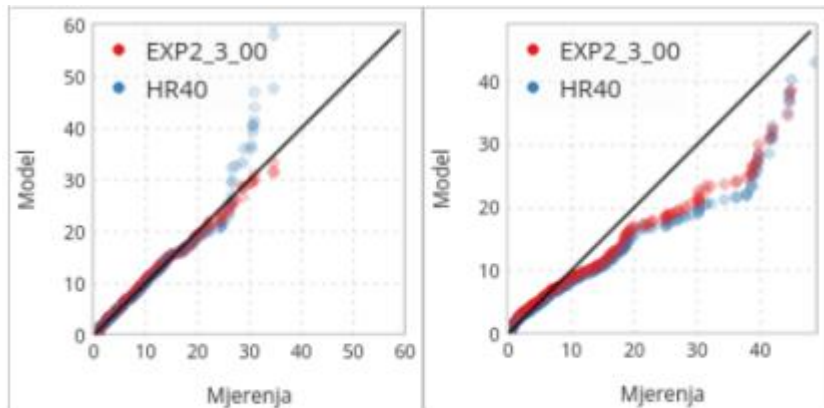


- ▶ New settings operational from 22.04.2024.



- ▶ Radar reflectivities from OPERA were successfully implemented in the Croatian operational chain from the end of 2023
- ▶ Data now comes from the NIMBUS production line – it showed comparable performance when compared with data from the ODYSSEY production line
- ▶ rain threshold and observation error inflation of undetected data methods were tested for local implementation
- ▶ Both methods reduced the "drying" effect in Bayesian inversion for reflectivity data

- ▶ The combined method with the error inflation offset of 0.35 and the threshold of 0.0 (exp2_3) performed the best and it was selected for operational implementation



*Fig.6: Q-Q plot of modeled and observed 1h rain rates;
Continental (left) and coastal (right) stations*

- improved 1h rain rates at the location of Croatian automatic stations

- neutral scores when compared with the operational system (ALADIN-HR40) for surface and upper air parameters

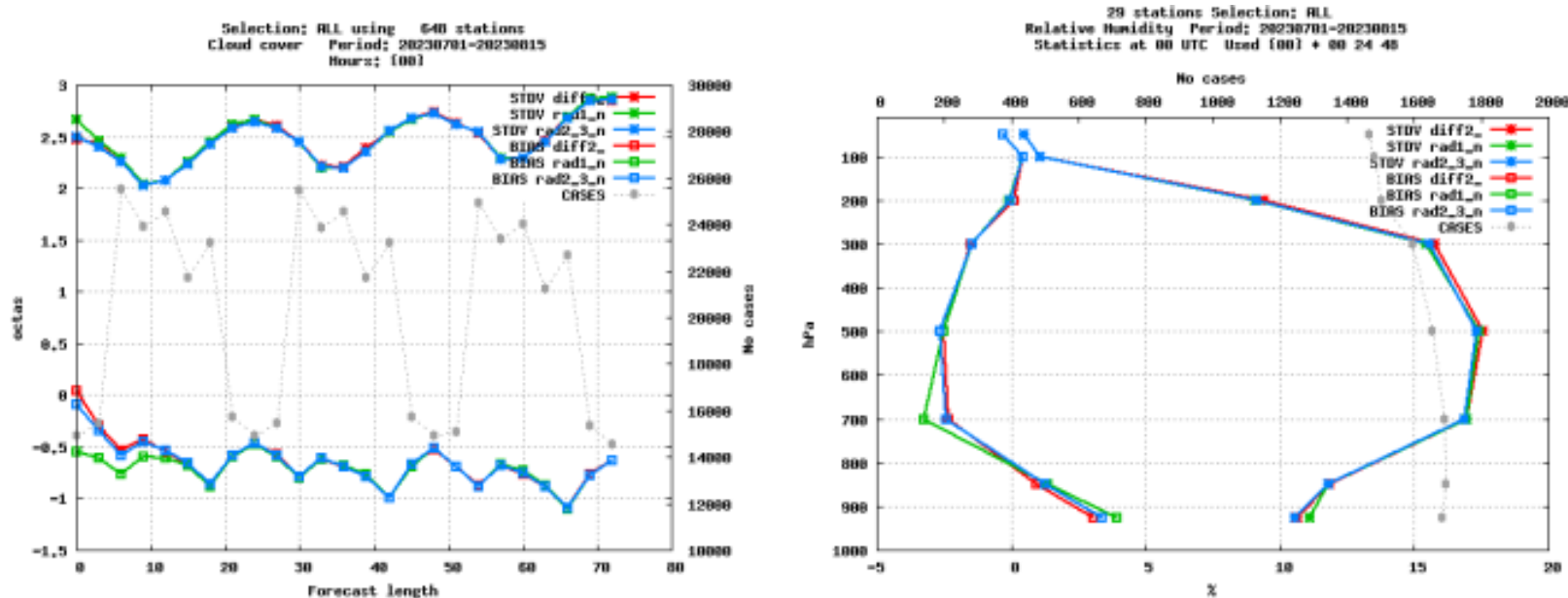


Fig.5: Bias and STDV for cloud cover and RH profile for summer period; Operational suite HR40 - no radar
DA (red), AROME-MF setup (green), combined methods (blue)

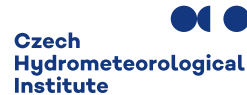
- ▶ Problems related to memory in screening were noticed after operational implementation in situations with spatially widely distributed precipitation patterns
 - ▶ Thinning distance in the bator namelist increased

- Include new automatic stations in DA system from METMONIC project (local upgrade)
- Preparation of all-sky code for assimilation of IASI data (C-LAEF)
- Work on assimilation of IRS data from MTG-S1 (C-LAEF)

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Thank you for your attention.



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Slovenia