Regional Cooperation for Limited Area Modeling in Central Europe

LACE
nwp central europe

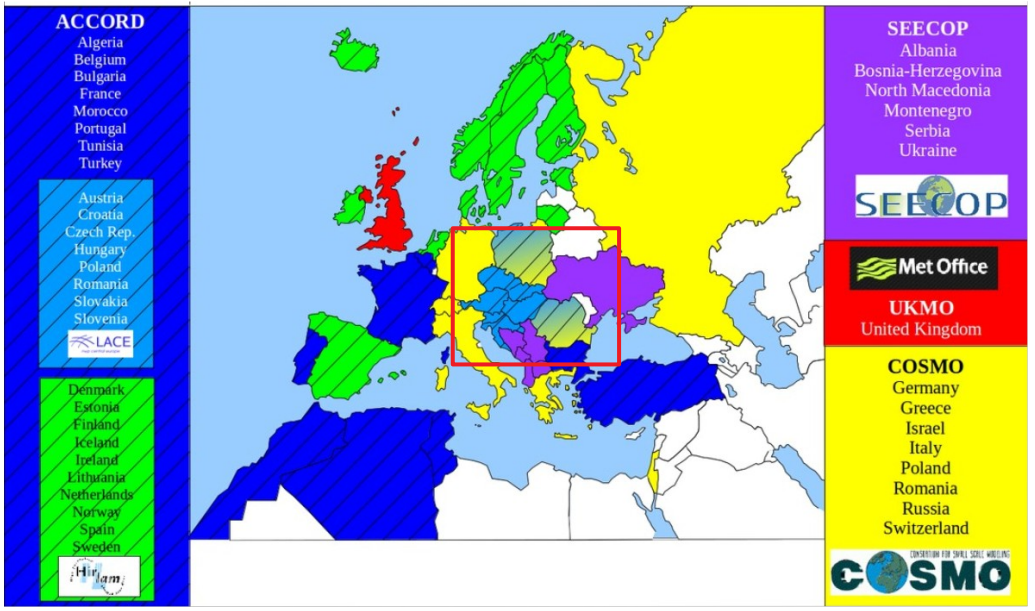
RC LACE activities in 2023

Martina Tudor on behalf of RC LACE MG and many researchers

GeoSphere Austria · DHMZ · Czech Hydrometeorological Institute · OMSZ · IMGW · METEO ROMANIA · SHMU · ARSO METEO Slovenia

Who? What?

- NMSs of
- **Austria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia**



- **Common operational applications**
  - **A-LAEF – Limited Area Ensemble Forecasting system**
  - **OPLACE – observation pre-processing for LACE**
- **Common research activities**
- **http://www.rclace.eu/?**

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Organization and changes

- Project Manager: Martina Tudor
- Area Leaders:
  - **Data assimilation (upper air and surface): Antonín Bučánek**
  - **Dynamics and coupling: Petra Smolíková**
  - **Physics (and surface parametrizations): Bogdan Bochenek ->**Mario Hrastinski**
  - **Predictability: Clemens Wastl**
  - **Applications and verification: Simona Taşku**
  - **Data Manager: Alena Trojáková**
  - **System and Code Coordinator: Oldřich Španiel**

Benedikt Strajnar ->

**temporary until call finished






Operational

Forum

Operational DA – short-range deterministic

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DA	AUSTRIA AROME	CROATIA ALARO	CZECH REP. ALARO	HUNGARY ALARO	HUNGARY AROME	SLOVAKIA ALARO	SLOVENIA ALARO
Resol	2.5L90, 600 x 432	4.0L73 480 x 432	2.3L87-NH 1069 x 853	8L49 349x309	2.5L60 490x310	4.5L63 625x576	4.4L87 432 x 432
Cycle	43t2bf11	43t2bf10	46mp_op1	cy43t2bf11	cy43t2bf11	cy43t2bf11	43t2_bf10
LBC	IFS 1h (lagged)	IFS 1h (lagged)	ARP 3h	IFS 3h (lagged)	IFS 1h (lagged)	ARP 3h	IFS 1h/3h (lagged)
Method	OI_main MESCAN + 3d-Var	OI + 3D-Var + Jk	OI + BlendVar	OI + 3D-Var	SEKF + 3D-Var	OI + BlendVar	OI + 3D-Var
Cycling	3h	3h	6h	6h	3h	6h	3h
B matrix	EDA on C-LAEF	EDA	EDA	EDA	EDA	-	Downscaled ECMWF ENS
Initialization	No (SCC)	No (SCC)	IDFI in production, SCC	DFI	No	No	No (SCC)
Obs.	Synop + AS Amdar/ Mode-S EHS EU Geowind Temp ASCAT, Snowgrid/MODIS snowmask.	Synop Amdar/MRAR Geowind Temp Seviri	Synop + AS (soil) Amdar/MRAR/EHS-EU) AMV/HR, Profiler, ASCAT, Temp Seviri,	Synop + AS Amdar Geowind Temp, Seviri AMSUA/MHS	Synop + AS GNSS ZTD Amdar/Mode-S MRAR Temp AMV+HRW	Synop + AS, TEMP, HRW, AMDAR, Mode-S	Synop + AS Amdar/MRAR/ EHS Geowind Temp Seviri AMSUA/MHS/IASI ASCAT/OSCAT E-GVAP ZTD (passive)

+ Romaina ALARO, Poland ALARO and AROME dyn. ad.

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Operational DA – hourly systems

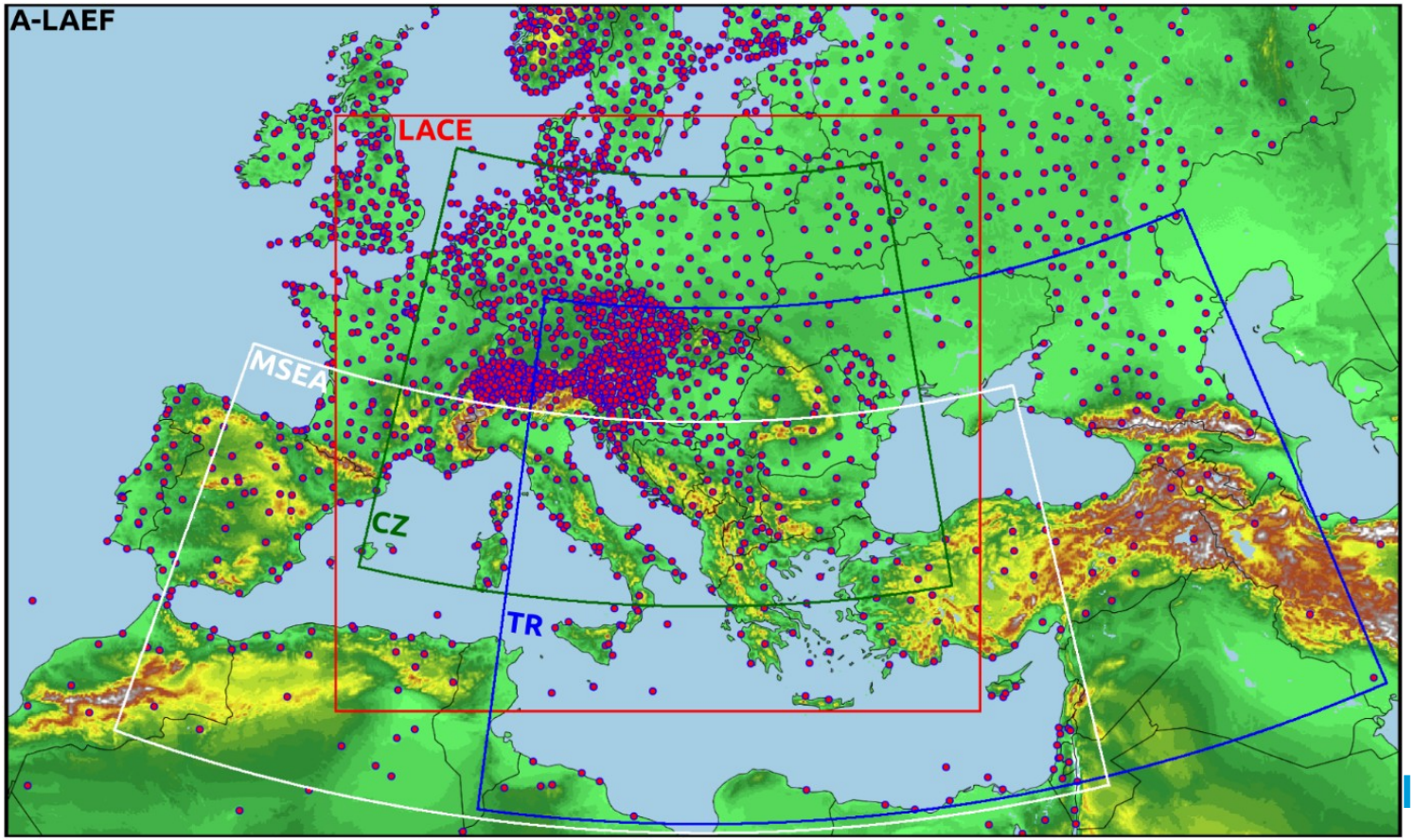
DA	AUSTRIA AROME-RUC	CZECH REP. VarCanPack	SLOVENIA ALARO-RUC
Resol	1.2 L90 900 x 576	2.3L87-NH 1069 x 853	1.3L87 589x589
Cycle	43t2bf11	46mp_op1	cy43t2bf10
LBC	AROME 1h	-	ECMWF 1h
Method	OI_main MESCAN + 3d-Var + LHN + FDDA	3DVAR + OI	3D-Var + OI
Cycling	1h	-	1h
B matrix	Static EDA + differences of the day	EDA	static DSC ENS
Initialization	IAU	-	No (SCC)
Obs.	Synop + AS, Amdar/MRAR/EHS national, EHS EMADDC, Geowind, Temp/BUFR Temp, Seviri, AMSUA/MHS/HIRS/ATMS/IASI (+ Metop-C), ASCAT, GNSS ZTD (Austria + EGVAP 1h VarBC), GPSRO (OPLACE), Radar RH/Dow, INCA + AS at hig.freq., MODIS snowmask, celiometer, tower obs.	Synop + AS, Amdar/MRAR/EHS, Geowind/HRWIND,Profiler, ASCAT, Seviri	SYNOP + AWS, AMDAR/MODE-S MRAR/EHS, AMV, TEMP, SEVIRI, AMSU-A/MHS/IASI, ASCAT/OSCAT, OIFS radar reflectivity

Operational DA – ensemble systems

DA	AUSTRIA C-LAEF	HUNGARY AROME-EPS	LACE A-LAEF
Resol.	2.5 L90, 600 x 432	2.5 L60, 490 x 310	4.8 L73, 1250 x 750
Cycle	43t2bf11	cy43t2bf11	40t1
members	16+1	10+1	16+1
LBC	IFS-EPS	IFS ENS 1h (lagged)	IFS 6h (lagged)
Method	OI_main MESCAN + 3d-Var, pert. obs. + Jk	SEKF + 3D-Var	DF blending + ESDA
Cycling	3h	3h	12h
B matrix	EDA on C-LAEF	Static EDA	-
Initialization	No	No	No
Obs.	Synop + AS, Amdar, Geowind, Temp, ASCAT, Snowgrid/MODIS	SYNOP + AWS, GNSS ZTD, AMDAR, MODE-S MRAR, TEMP, AMV+HRW	Synop + AS

Common ensemble A-LAEF
Martin Belluš

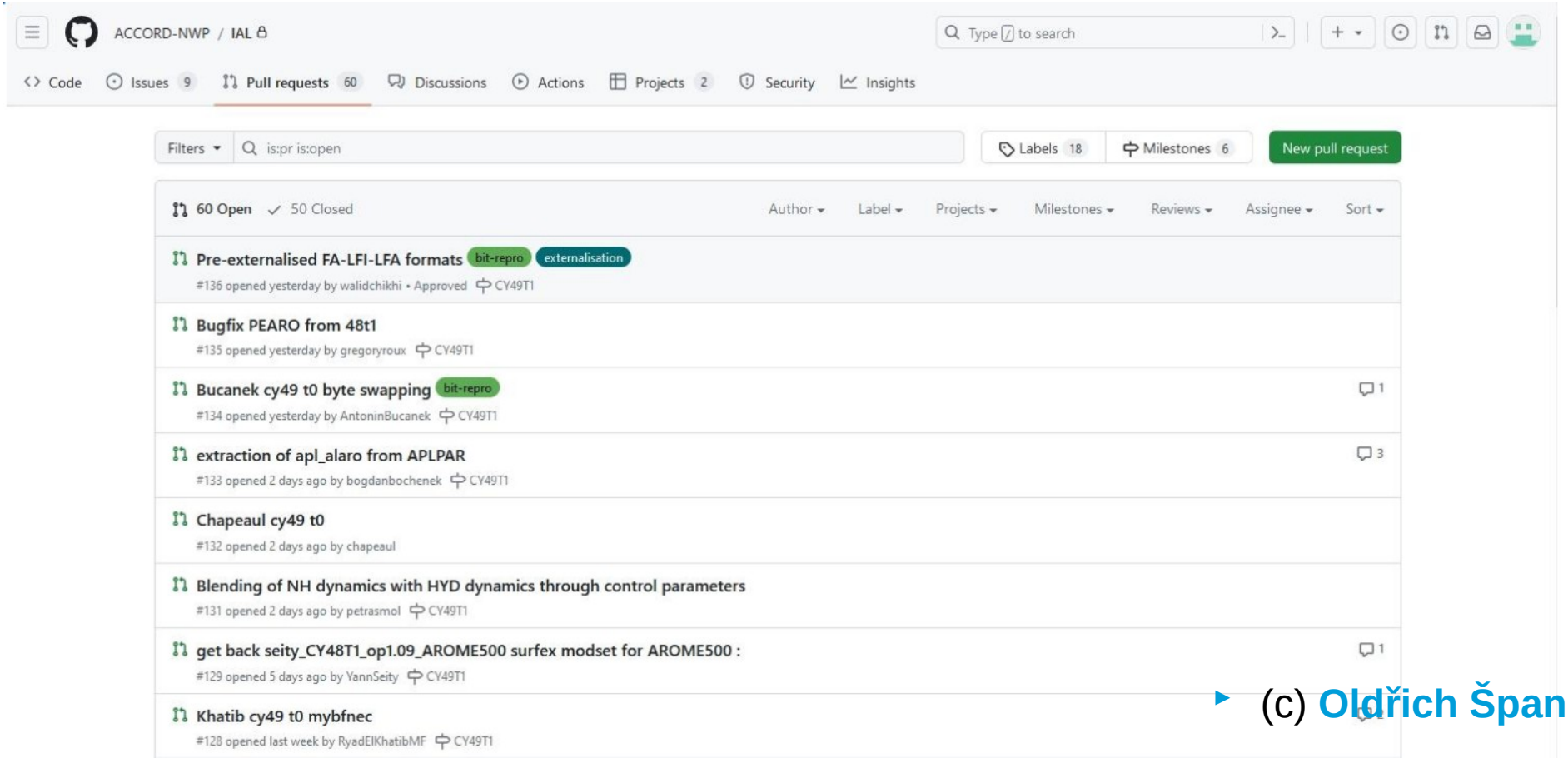
- Operational domain with
- data used in ESDA
- Postprocessing domains
- Run as TC2 in ECMWF
- Shared SBU resources (Slovenia, Croatia & Turkey)



System and Code Coordinator SCC (Oldřich Španiel)

- Phasing of common cy49t1 cycle
  - **cy49t0 – released April 2023**
  - **Cy49t1**
  - **More than 60 contribution branches**
- Implementation of cy48t3 cycle on ATOS (ECMWF one!)
  - Installation and testbed
- Phasing of common cy50 cycle
- Implementation of cycle cy48t3 on LUMI
- Single precision code
- **Administration and Maintenance of the RC LACE Web site and Forum**
  - **ALARO and AROME operational products**

Phasing of the common cycle CY49T1



- (c) **Oldřich Španiel**

Phasing of common cy49t1 cycle (SCC)

- Documentation:
  - **RC LACE Forum https://www.rclace.eu/forum/viewforum.php?f=734**
  - **https://github.com/ACCORD-NWP/IAL/pulls?page=1&q=is%3Apr+is%3Aopen**
  - **Efforts: 2.0 PM (remote phasing)**
  - **Status: the cycle CY49t1 is going to be merged in the integration branch by Integrator**
- DAVAI WW - Monday 23rd - Friday 27th Oct, Brussels
  - **getting a bit deeper in the tests and some Vortex mechanics**
  - **improvements based on users feedback from the teams experience for 49T1 contributions**
  - **setting a Harmonie-Arome forecast test with CY49T1**
  - **porting Davai to yet another machine to test portability**
  - **introduction of an ALARO+SURFEX test**
  - **discussion about finer-grained tests (level of e.g. spectral transforms, physics parameterizations, etc.)**
  - **documentation**

- (c) **Oldřich Španiel**

Implementation of cy48t3 cycle on ATOS

- Installation of CY48T3 on ATOS in Bologna (ECMWF ATOS machine)
  - (involves fixes from Ryad and Florian)
- Testbed set of scripts and namelists for ALARO and AROME
- Please check the available documentation
  - **RC LACE Forum**
  - **https://github.com/ACCORD-NWP/IAL/**
  - **Also report and LSC presentation (RC LACE web page registration needed)**
- (c) **Oldřich Španiel**

Data Manager (Alena Trojáková) activities

- OPLACE maintenance & development
  - **New data types,**
  - **Meteosat 10 and 11,**
  - **Missing GTS bulletins were identified,**
  - **3rd Aug 2023 the processing of GTS SYNOP was extended by snow height**
- Data exchange
  - **See the next slides**
- ODB support
  - Provided on request

- (c) **Alena Trojáková**

Data Exchange activities

- Additional measurements from LACE members not going through GTS
  - The total number of exchanged stations increased by 106
  - The extension of the national data exchange to include the new precipitation parameters, which was launched last year, has been successfully implemented in other countries of the consortium, namely Austria, Hungary and Slovakia. And it will soon be completed in Poland.
  -
  - (c) **Alena Trojáková**

Data Manager (Alena Trojáková) activities

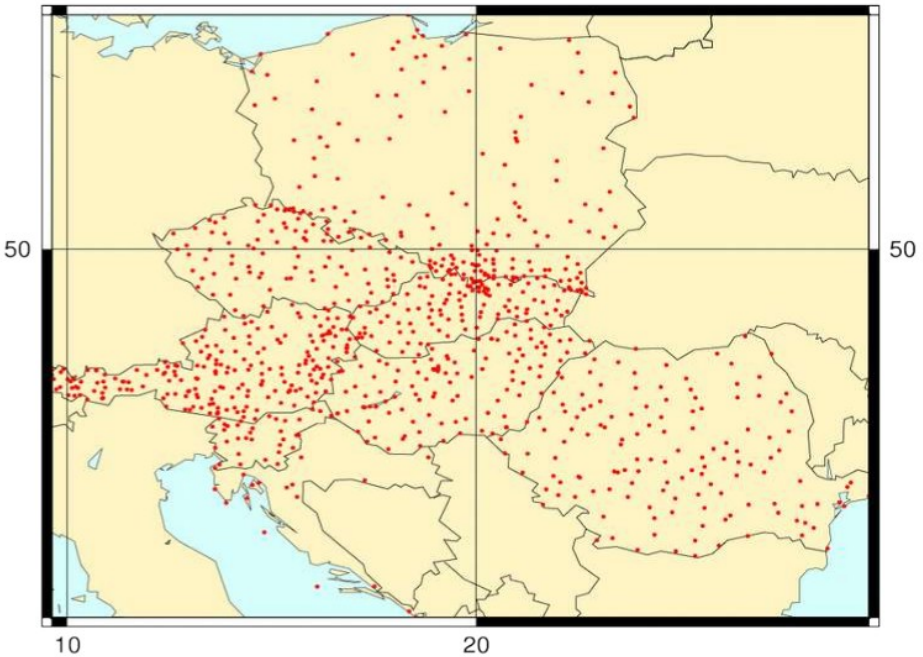


Figure 1: Geographical distribution of exchanged national synoptic data.

Number of national stations		Update WRT 2022
Austria	202	-0/+34
Croatia	18	-4/+2
Czech Republic	89	-0/+0
Hungary	109	-1/+1
Romania	134	-0/+0
Slovakia*	24+72	-3/+74
Slovenia	12	-0/+0
Poland	173	-4/+0
Total:	**833**	

Table 1: Overview of exchanged stations.
* Slovakia provides GTS and national data.

- (c) **Alena Trojáková**

Data exchange – Mode S MRAR and EHS

- high-resolution aircraft observations from modern air surveillance systems Mode-S MRAR (Mode-S Meteorological Routine Air Report) systems has shown a gradual decline in data amount
  - ()
- The main source of the high resolution aircraft observations became Mode-S EHS (Enhanced Surveillance) from KNMI (EMADDC).
  - **OPLACE adapted to handle the new EMADDC data format (more efficient, no impact on users)**
  - **the "fast" Mode-S EHS data have been added to OPLACE in August 2023 (BUFR)**
    - (c) **Alena Trojáková**

Data Manager (Alena Trojáková) activities

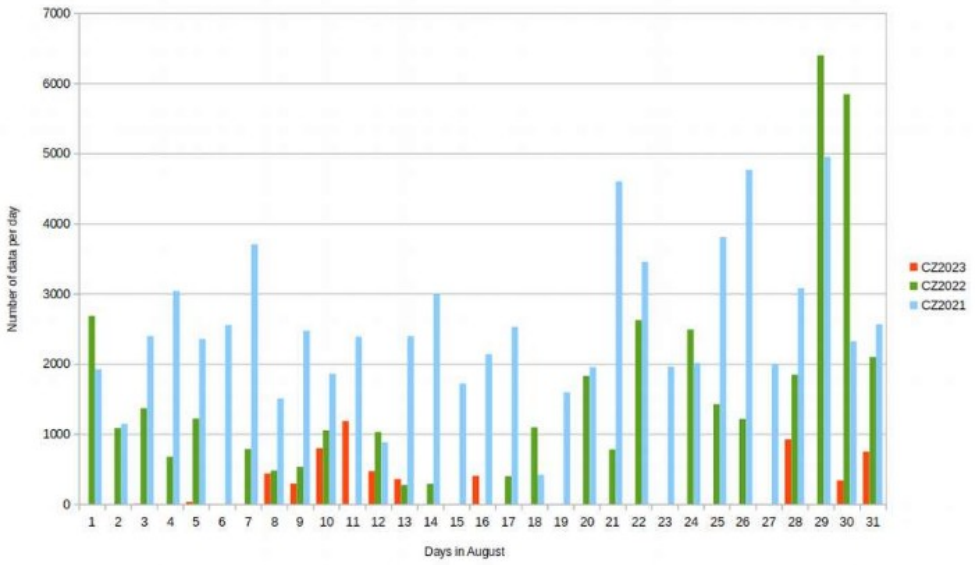


Figure 2: Number of MRAR data per data from the Czech Republic for 2023, 2022 and 2021.

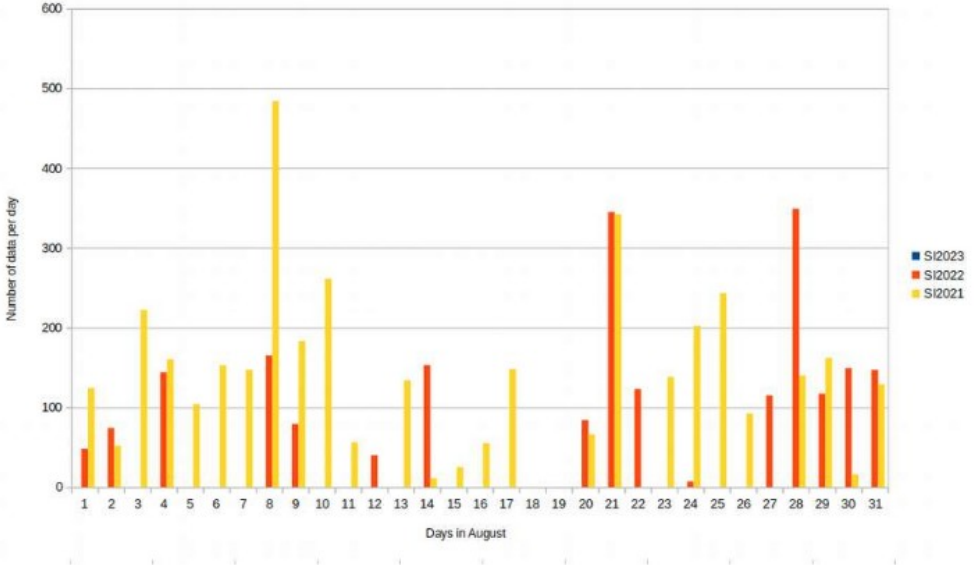


Figure 3: Number of MRAR data per data form Slovenia for 2023, 2022 and 2021.

- (c) **Alena Trojáková**

Other RC LACE presentations

- Surface, Tuesday 9:30
- Data Assimilation within Beni&Magnus presentations, Tuesday 10:45
- Upper air physics Tuesday 13:50
- EPS, Clemens, Wednesday 11:00
- Dynamics, Petra, Thursday 10:10

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Thank you for your attention.

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DHMZ
Czech Hydrometeorological Institute
OMSZ
IMGW
METEO ROMANIA
SHMU
ARSO METEO Slovenia