

*Regional Cooperation for  
Limited Area Modeling in Central Europe*



# Status of DA on SHMU 2017

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ARSO METEO  
Slovenia



# Oper suite on SHMU

## ALARO-I CY40T1 4.5km 63level running on HPC2 ( IBM – Linux )

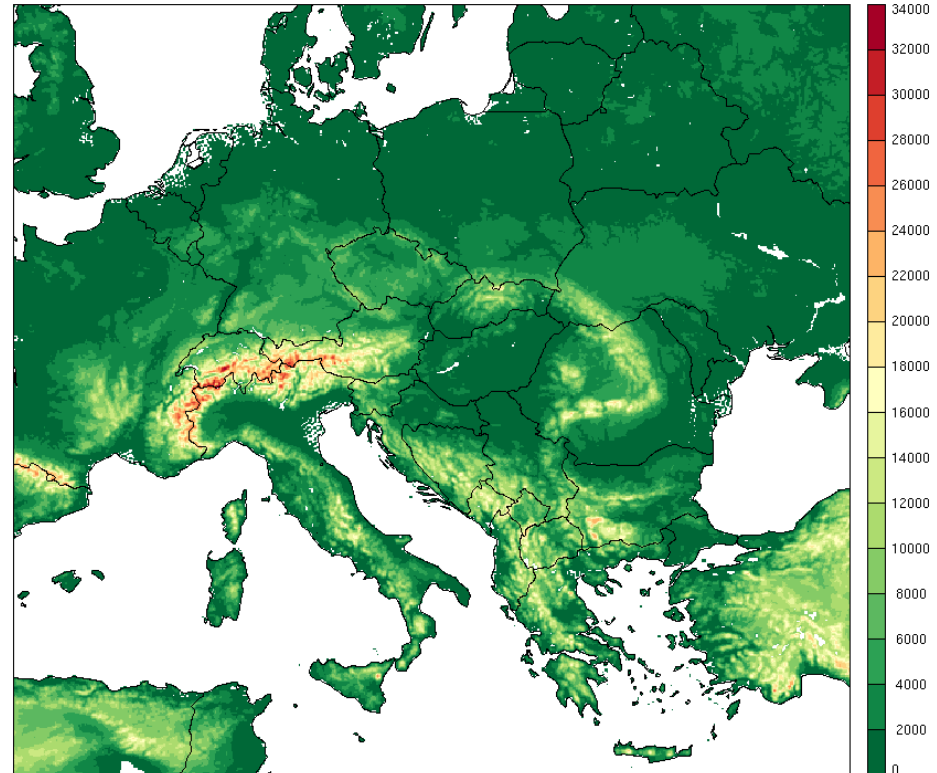
- CANARI ( OPLACE + local obsoul )
- blending

02:55 prod 00 UTC (03:43)

09:45 prod 06 UTC (10:31)

14:35 prod 12 UTC (15:21)

21:45 prod 18 UTC (22:25)



# GNSS data assimilation on SHMU

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Martin Imrisek, Slovak University of Technology in Bratislava + partly on SHMU

- work on ZTD DA in SHMU on AROME cy40T1 2.5km ( same domain as OMSZ )
- 32 stations, Static bias corection
- more in his presentation: Global Navigation Satellite System data processing

# Calculation of Bmatrix

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Ensemble Bmatrix based on PEARP data (over two periods in 2016) is in preparation for an AROME domain with 2.0 km horizontal resolution, 512 x 384 points and 73 vertical levels, with the aim to test the GNSS ZTD data and radar data assimilation.

Identical domain is defined for ALARO 2 km, its Bmatrix is planned to be computed as well in later stage.

# Surfex

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- ▶ Offline Surfex 7.3 Cy40TI (SHMU HPC2 Linux) ALARO
- ▶ Pre-operational implementation of 1-way coupling of SURFEX to new (4.5 km) operational model (SURFEX offline mode).
- ▶ Aims for better representation of a surface and surface boundary layer (below lowest model level) => more accurate analysis and forecast of soil and screen-level variables.
- ▶ Development of application which prepares offline SURFEX forcing consistently from different sources (INCA,AROME) has been started. Ongoing validation of offline SURFEX with 1-column configuration on interesting cases (PGD testing, forcing with observations, testing different initializations).
- ▶ Continue work from OMSZ (Validation of EKF )

# Plans from April 2017

Joint 27th ALADIN Workshop & HIRLAM All Staff Meeting 2017, 3-7/04/2017, Helsinki  
Plenary session I on DA

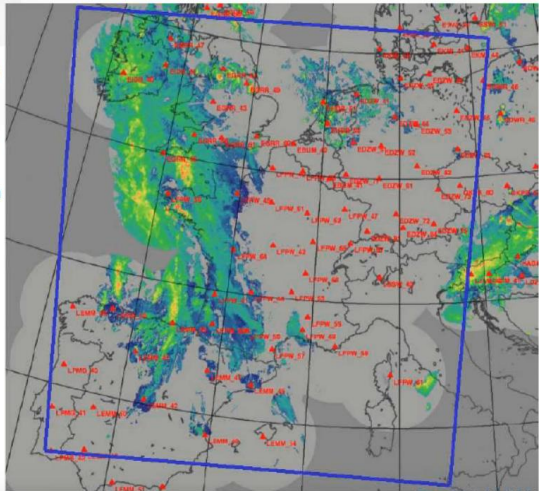
C. Fisher – Progress and plans of global and LAM DA at Meteo France  
<https://www.youtube.com/watch?v=SiFzVg2A-kI> (18:40)

- CONRAD is no longer used
- Direct HDF5 to ODB
- I communication with WATTRELOT Eric - (2017-June) *“The direct conversion from HDF to ODB will be possible in the next cycle. It works well now based on cy42 (op for MF) in my pack and Frank Guillaume's pack (!), but it has not been introduced in the common code yet.”*  
And then we wait for `bator_decodhdf_mod.F90 ...`

ASM 2017 - session 1

EUMETNET/OPERA: implementation of operational monitoring of 34 radars is currently underway in AROME

- ☑ CONRAD software is no longer used
- ☐ Direct conversion and treatment of Odyssey HDF to ODB (AROME) in BATOR (34 or 50 partially included in the AROME domain)
- ☐ Feedback to Odyssey: changes in attributes coding (and no need to get back to each NMS)
- ☐ Feedback to OPERA and NMS: changes in ODIM 2.2 standard are required (and accepted), as well as for NMS, compliance with ODIM standard and required additional information is desirable in non-mandatory attributes



18:19 / 1:50:29

METEO FRANCE

# Way to Hi-res models on SHMU

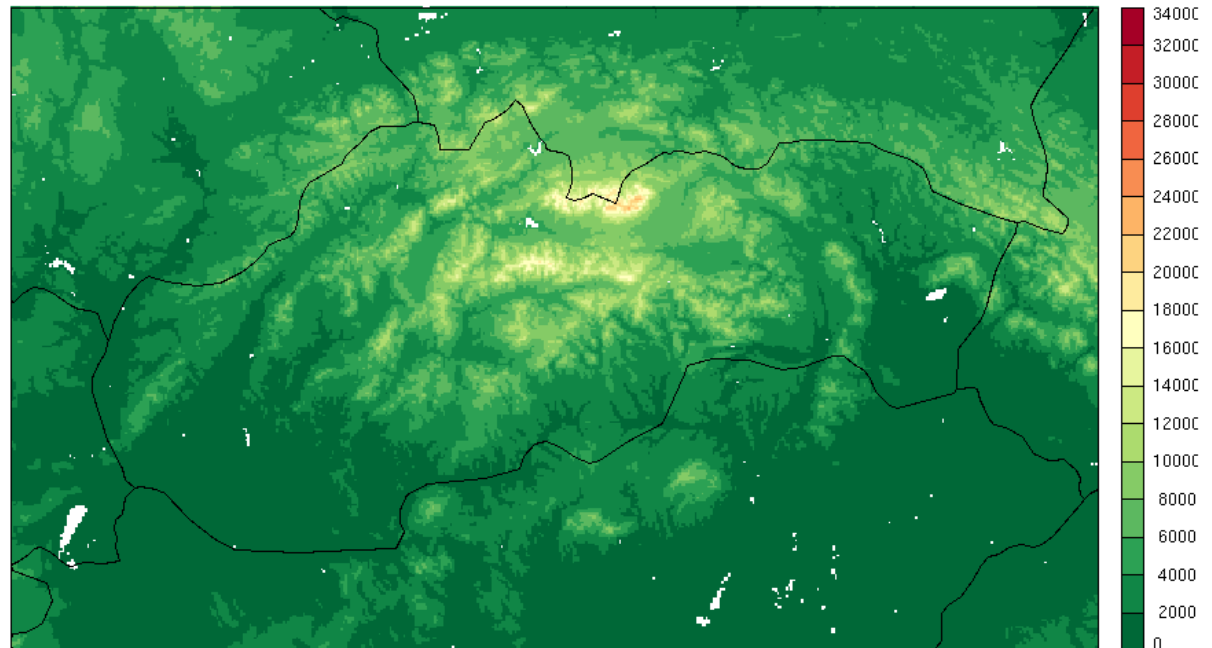
In perion 2016-12 to 2017-06 **ALARO-I CY40TI 1km on HPC2 ( IBM – Linux )**

04:10 00 UTC (+F24h 4:28) run after OPER 4.5km suite

22:28 18 UTC

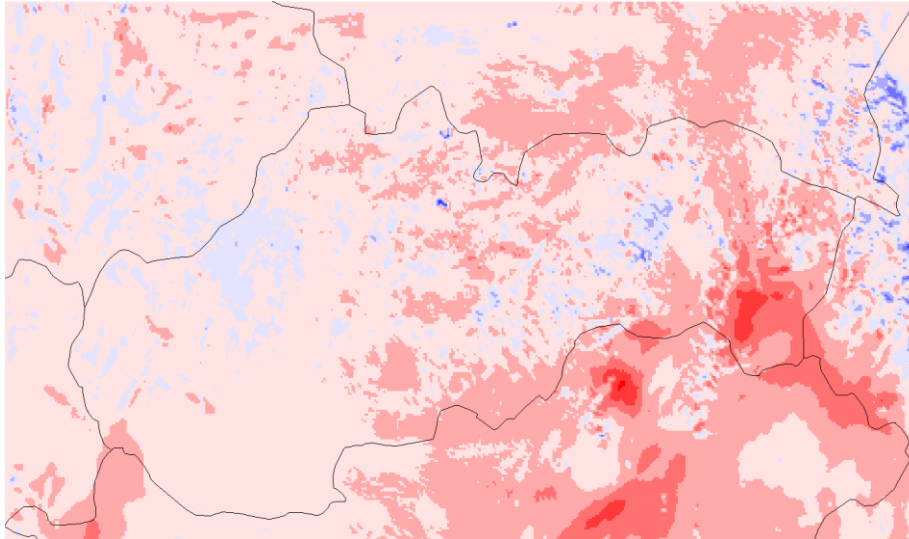
23:40 06 UTC (-1 day)

05:40 12 UTC (-1 day)

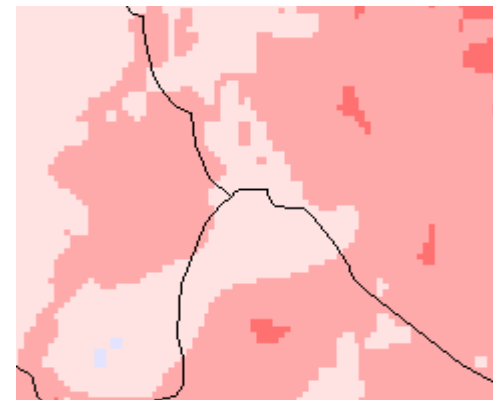
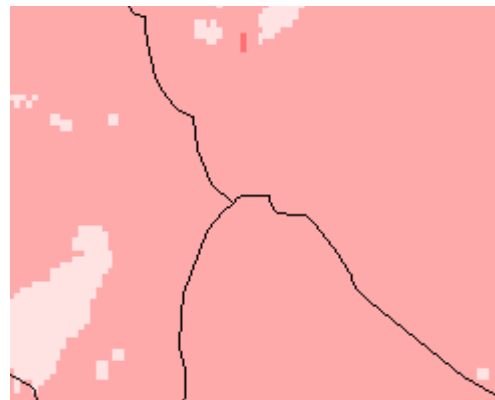
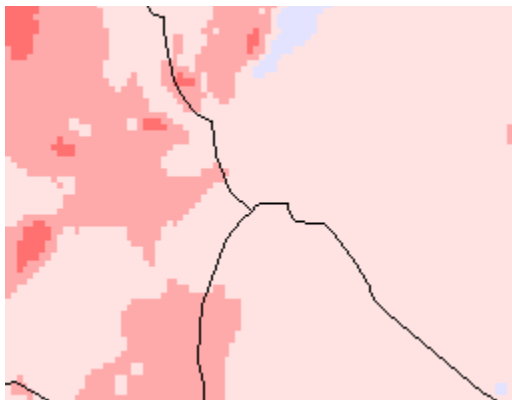


ALARO-I with Domain and resolution as INCA-SK

# Way to hi-res models on SHMU

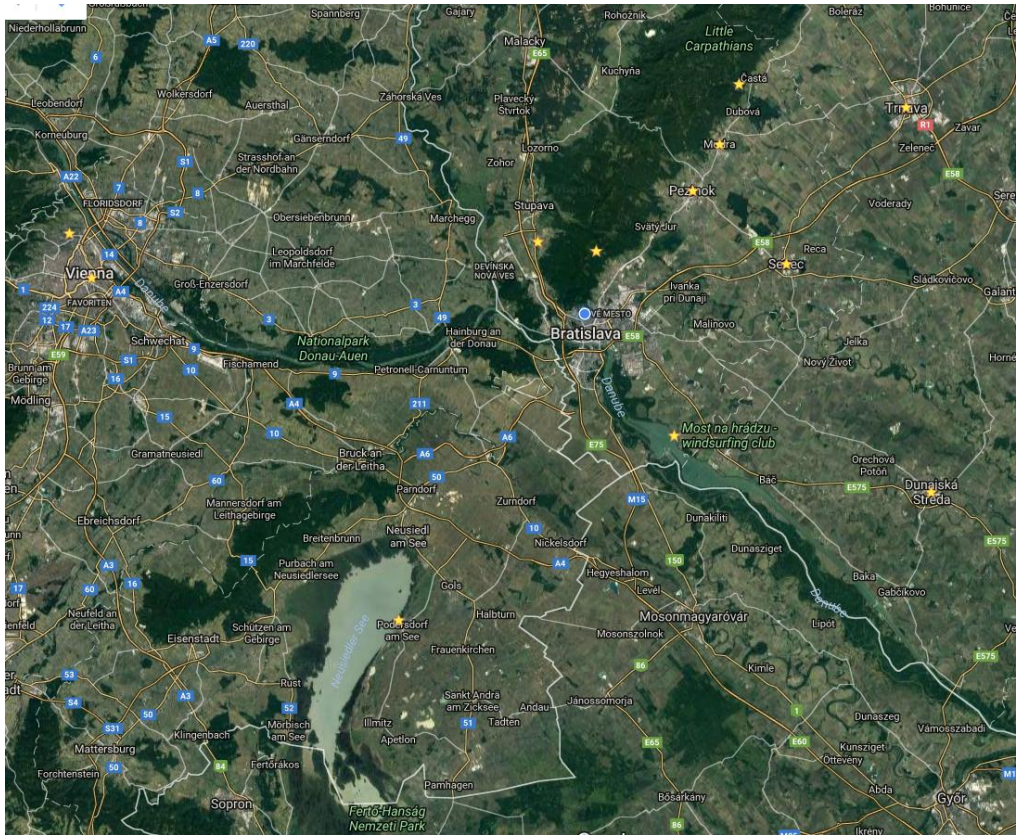


- Some case and technical tests with CANARI / MESCAN (T2m + RH) CY40T1 on 1km resolution
- bad coverage with conventional data for this resolutions





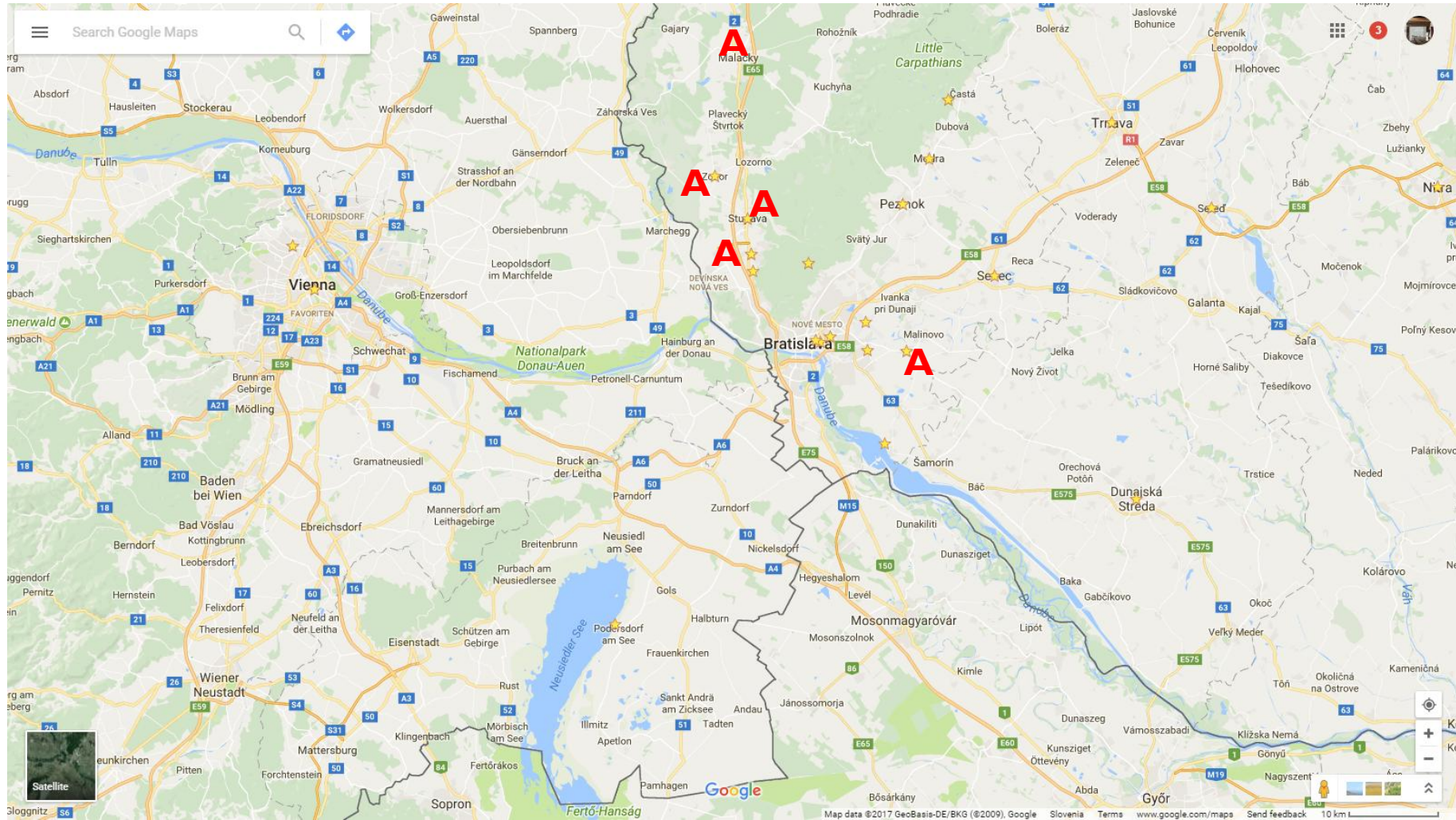
# Why is this area so interesting?



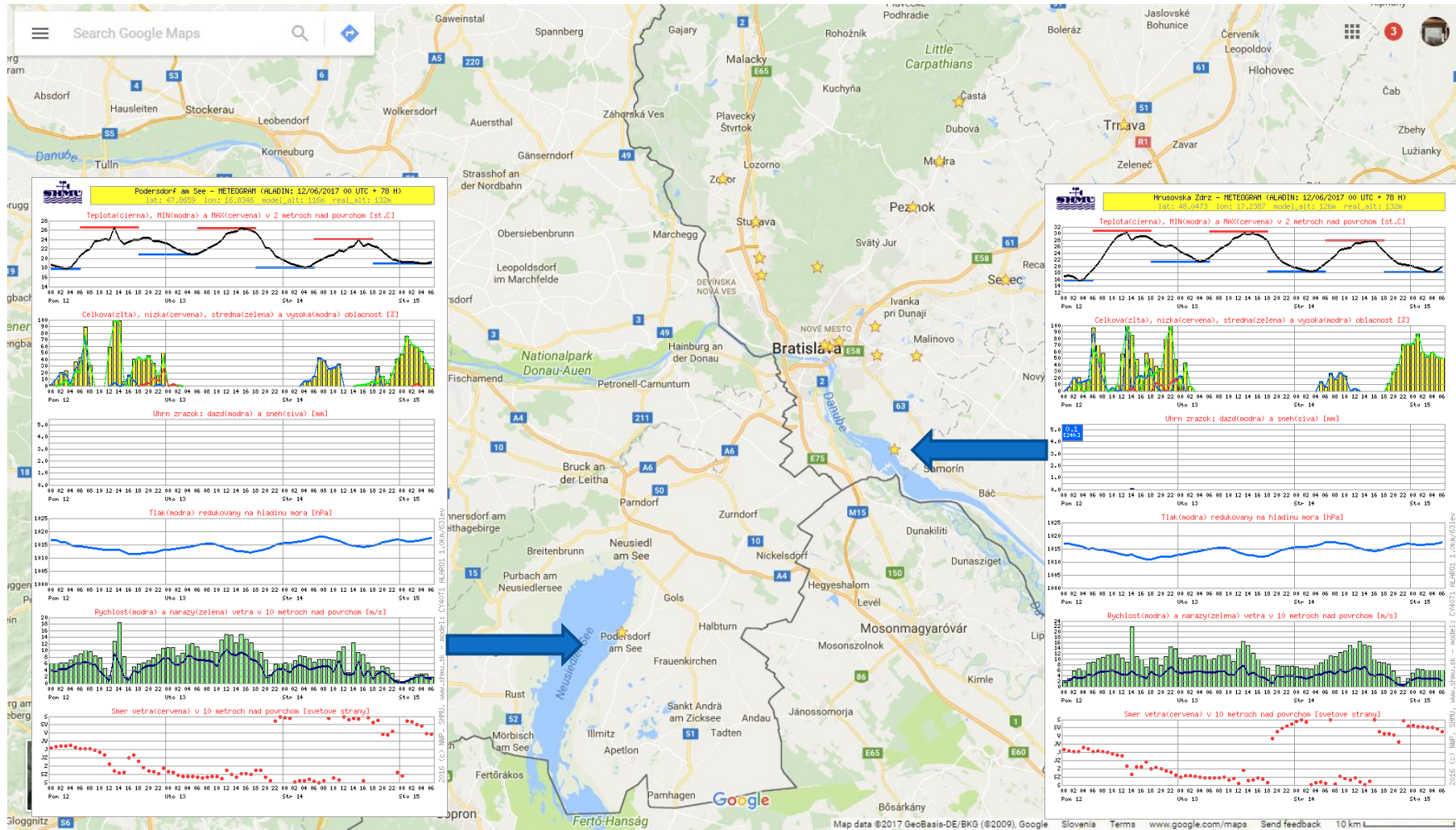
- **Bratislava (0.5 mil )**
- **Wien (1.868 million )**
- **Brno (377,028)**
- **Győr (129,568 )**
- **Sereď (16k)**
- **Pezinok (23k)**
- **Trnava (66k)**
- **Nitra (77k)**
- **Dunajska Streda (23k)**
- **Malacky (17k)**
- **Most pri Bratislave (3k)**



# Why is this area so interesting?



# Why is this area so interesting?

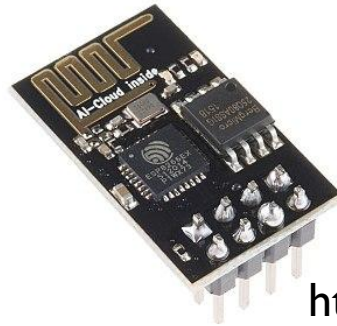
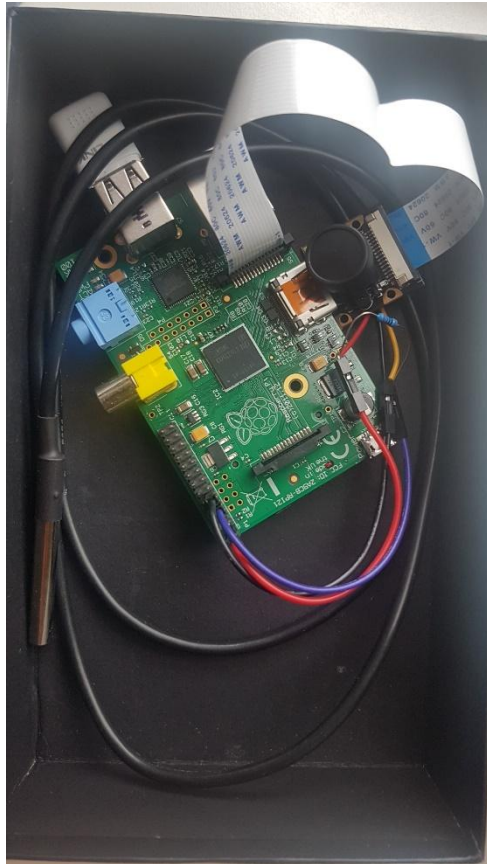


Podersdorf am See

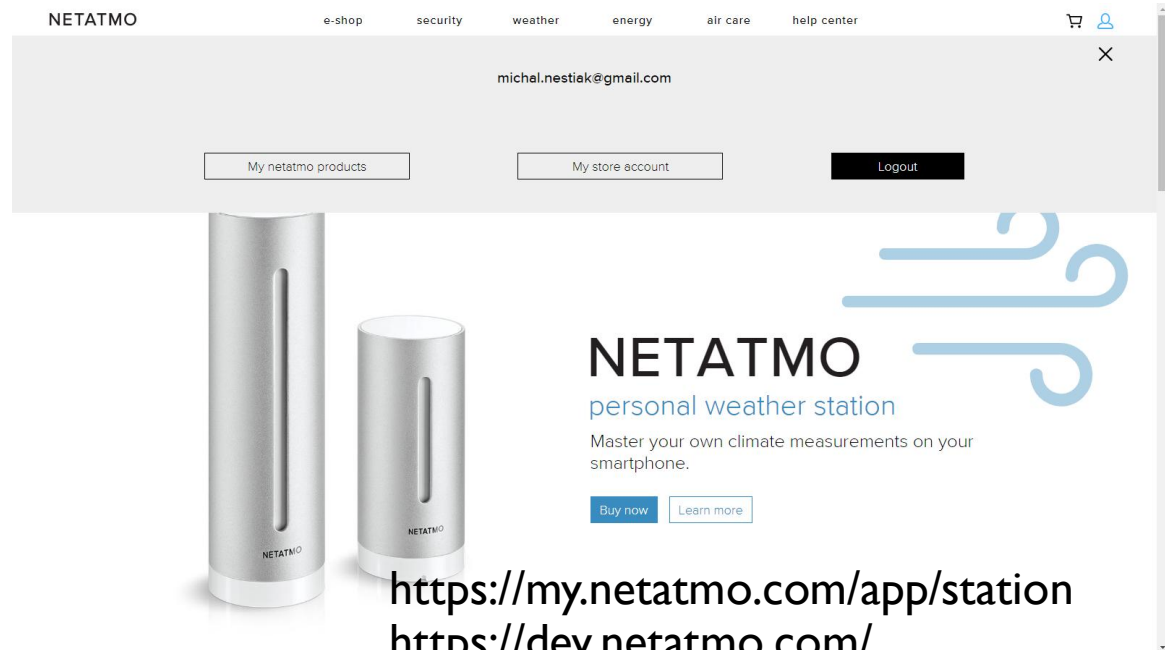
Hrusovska Zdrz



# NON-GTS & IOT measurments



<http://esp8266.net/>



NETATMO e-shop security weather energy air care help center

michel.nestiek@gmail.com

My netatmo products My store account Logout

**NETATMO**  
personal weather station

Master your own climate measurements on your smartphone.

Buy now Learn more

<https://my.netatmo.com/app/station>  
<https://dev.netatmo.com/>

<https://www.raspberrypi.org/>



# NETATMO – already “owned” 2-stations

The screenshot displays the NETATMO web application interface. At the top, there is a navigation bar with 'NETATMO', 'Weather', 'Energy', and 'Security' tabs. The user is logged in as 'JerryK Residence' on '18. sep 2017 8:10'. The main content area is divided into several sections:

- JERRYK OPUT:** Outdoor air quality (38), 7-DAY FORECAST, Temperature (9.6° C), Humidity (88%).
- PRACOVNA:** Indoor comfort, Temperature (22.2° C), Humidity (60%), Pressure (1013.2 mb), CO<sub>2</sub> (729 ppm), Sound meter (35 dB).
- OBYVACKA:** Indoor comfort, Temperature (23° C), Humidity (47%).

A central map of Bratislava, Slovakia, is overlaid with a white box showing a 'Height' of 120 m. To the right, a 'NETATMO weathermap' section shows a list of stations: 'Schüttel' and 'JerryK Residence' (9.6). The interface includes various charts and data visualizations for weather and indoor air quality.

<https://dev.netatmo.com/>



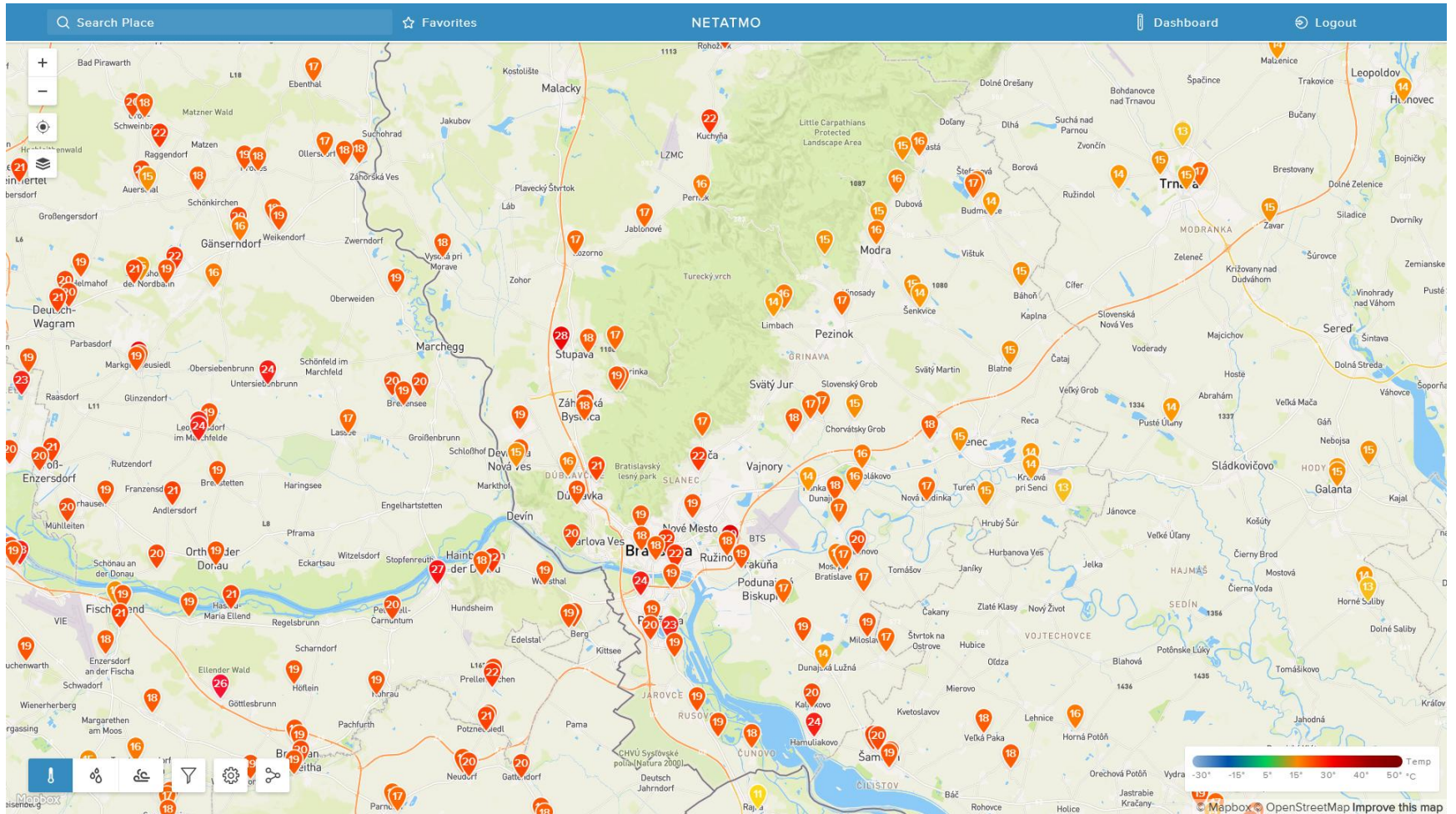
# NETATMO – already “owned” 2-stations

The screenshot shows the NETATMO web application interface. At the top, there is a navigation bar with 'Weather', 'Energy', and 'Security' tabs. The main content area is divided into several sections. On the left, there is a sidebar for the 'Schüttel' station, showing details for 'JARDIN 1' (Outdoor air quality: 35, 7-DAY FORECAST, Temperature, Humidity) and 'JARDIN 2' (Last hour, Today). Below this is the 'BASE' section (Indoor comfort, Temperature, Humidity, Pressure, CO<sub>2</sub>, Sound meter) and the 'DORMIUM' section (Indoor comfort, Temperature). The main area features a 'NETATMO weathermap' overlay. This map shows a search bar, a map view, and station information: 'NETATMO weathermap', 'Schüttel', '9.6 JernK Residence', and 'STATION ADMINISTRATORS' (michel.nestleik@gmail.com, dnvolke@chello.at). A 'No data available for this period' message is displayed at the bottom of the map overlay.

<https://dev.netatmo.com/>



# NETATMO public stations

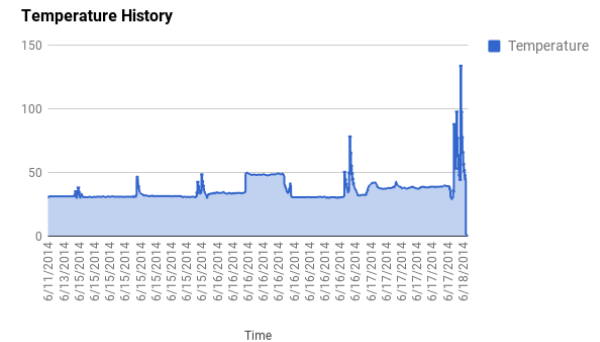
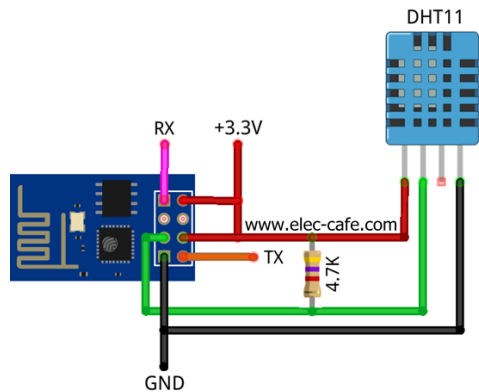


<https://weathermap.netatmo.com/>



# IOT - WIFI ESP8266 - T and RH into Google Spreadsheet

- ▶ <http://www.elec-cafe.com/esp8266-temperature-humidity-webserver-with-a-dht11-sensor/>



- ARDUINO problems with https use <https://www.pushingbox.com/api.php> for GET REQUESTs
- **Create CustomURL**
- only 1000 daily requests and day have 1440 minutes

## Your services

Here you can find the services you have subscribed to.





# IOT - WIFI ESP8266 - T into Google Spreadsheet

Temperature Data ☆

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

Comments Share

100% € % .0\_ .00 123 Arial 10 B I A

Timestamp	Temperature Value
2017-08-10 12:00	27.5
2017-08-10 12:01	27.5
2017-08-10 12:02	27.5
2017-08-10 12:03	27.6
2017-08-10 12:04	27.6
2017-08-10 12:05	27.6
2017-08-10 12:06	27.6
2017-08-10 12:07	27.7
2017-08-10 12:08	27.8
2017-08-10 12:09	27.8
2017-08-10 12:10	27.8

Temperature History

Time



# IOT - WIFI ESP8266 to upload Temperature and humidity from DHT11 to Google Cloud Platform

- ▶ All info <https://cloud.google.com/>
- ▶ [jarkomdityaz.appspot.com](https://jarkomdityaz.appspot.com)
- ▶ [appengine.google.com](https://appengine.google.com) (access Spreadsheet API by Google Script)

## gcloud app deploy



```
Beginning deployment of service [default]...
Some files were skipped. Pass '--verbosity=info' to see which ones.
You may also view the gcloud log file, found at
[/tmp/tmp.M73mw2h06D/logs/2017.09.17/06.09.21.937929.log].

= Uploading 5 files to Google Cloud Storage =

File upload done.
Updating service [default]...done.
Waiting for operation [apps/nowcasting-908/operations/c84f7eac-8ea6-45c4-a599-a71c3f2998cf] to complete...done.
Updating service [default]...done.
Deployed service [default] to [https://nowcasting-908.appspot.com]
```

# Google Cloud Platform – Hello world

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- ▶ `TUTORIALDIR=~/.src/nowcasting-908/php_gae/`
- ▶ `git clone https://github.com/GoogleCloudPlatform/appengine-php-guestbook.git $TUTORIALDIR`
- ▶ `cd $TUTORIALDIR`
- ▶ `git checkout phase0-helloworld`
- ▶ `cat helloworld.php`
- ▶ `cat app.yaml`
- ▶ `dev_appserver.py --php_executable_path=/usr/bin/php-cgi $PWD`
- ▶ `gcloud app deploy app.yaml --project nowcasting-908`
- ▶ <http://nowcasting-908.appspot.com/>

# Winners : Hi-Res models on SHMU for 2017

From 2017-07 to nowadays

only 00 and 12 UTC runs (not enough CPU for more than 2 runs )

**ALARO-I CY40TI 2km 73level  
on HPCI ( IBM – AIX ) – old HPCI**

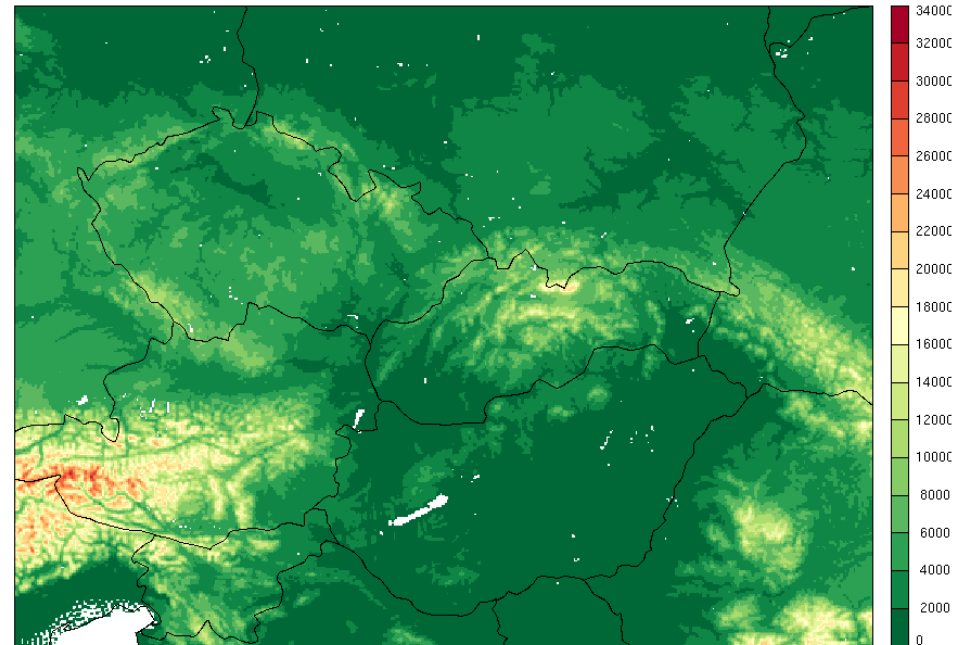
04:10 00 UTC

20:00 12 UTC

**AROME CY40TI 2km on HPC2  
( IBM – Linux )**

04:10 00 UTC

20:00 12 UTC



Or survivals????

# Plans in DA in SHMU

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- ▶ Continue on radar assim in SHMU with official Meteo France bator\_decodhdf\_mod.F90 ( MiNe [80%] )
- ▶ Continue work on computation B-Matrix (Mariska)
- ▶ Continue on SURFEX in SHMU and OMSZ (Viktor )
- ▶ I hope continue DA of GNSS (Imro)
- ▶ Non-GTS measurments
  - ▶ IOT ( MiNe [20%] )
  - ▶ Rassberry Pi ( Roman, Martin Dian, MiNe [20%] )
- ▶ Thanks for support JoVi, Mbell, Oldrich, **Roman Zehnal**