# Issues and Actions from the previous DAWD

## From DAWD 2011

2m analysis, forecast and SWI connections. Have this already been concluded or closed?

Investigate the lack of SURFRESERV.EAU increments in Canari analysis.

Degradation on geopotential forecast after 6 hours?

Reproducing negative humidity in AROME?

Any other?

## From DAWD 2013

Compilation problem in Romania – possible problem of enviromental settings and auxiliaries

Bator settings to read RADAR BUFR (ECMWF source, MF source)

# What will LACE DA be in 2020?

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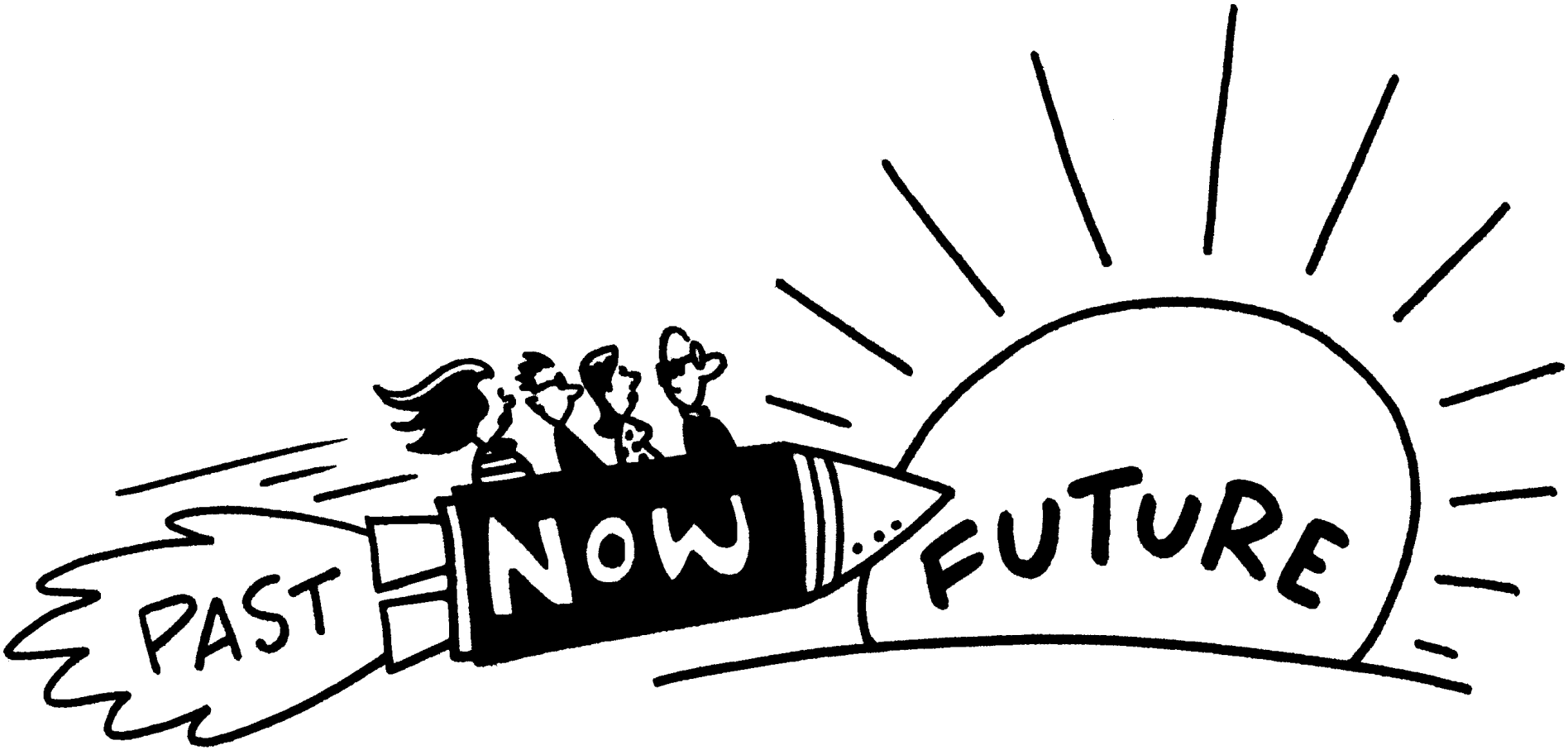

## Some aspects, other questions

What will be in the other countries, consortia?

What kind of constraints are driving or determining the progression of DA? Which challenges we have?

What about the observations?

What has happened in the last 5-7 years concerning LACE DA systems so far? Could we extrapolate such tendency of progression for the next 5-7 years?

What would we like to reach indeed within this period?

## From the neighborhood...(methods)

- ECMWF
  - Further integration of the EDA and 4DVAR system is expected within next 3 to 5 years
  - Development of 4DVAR itself (higher resolution loops, weak-constraint 4DVAR)
  - Ensemble Kalman Filter (EnKF), combination of EDA and EnKF
- UK MetOffice
  - Development of EnKF, focusing convective-scale DA
- COSMO
  - Further develop convective-scale EPS has high priority with applying ensemble-based data assimilation based on LETKF (KENDA project)

## From the neighborhood...(methods)

- ALADIN-HIRLAM
  - First priority for upper-air analysis is to refine the present 3DVAR for resolution 1-5km. Focusing on tuning observation and background error characteristics and observations usage, higher cycling frequencies and new observation types(radar!)
  - Use of high-frequency data optimally RUC approach should be further investigated
  - Fundamental issue of balance in km-scale models will be explored. Flow-dependent background error covariances by EDA, Hybrid 3DVAR/ETKF method, air-mass dependent background error covariances.
  - 4DVAR will be further assessed in a sense of convective permitting scale. Limitation of representing non-linear processes and scalability issues will be also investigated.

## From the neighborhood...(methods)

- ALADIN-HIRLAM
  - In Hirlam community will start the implementation of hybrid variational data assimilation scheme.
  - For long term the framework of enabling the implementation of an ensemble and VAR method (named 4DEnsVAR)
  - All of this future purposes will be involved in the OOPS project

## Challenges...

- Probably we can all agree on convective scale DA.

- Highly non-linear physical processes
- Observations from non-conventional sources,
- complex observation operator
- Different probability densities and errors (non-Gaussian)
- Flow-dependency became more and more relevant
- Model error is getting larger
- Limited predictability

## Observations...

- Top priority for those observations which spatially
- and temporally dense and considered most important
- for convective scale and future algorithms and methods.

- 3D RADAR(reflectivity and wind), GPS and geostationary
- satellite can be relevant sources and furthermore these can
- provide sub-hourly inputs for a very high frequency data
- assimilation as well.

- Radiance data from hyperspectral instruments.

- MTG

## What was in 2007 (7 years before)...

- (Report from LACE webpage.)

- Test with a 1st version of 4DVAR! Wow
- Experiments with 3D-FGAT
- Experiments with 3DVAR RUC
- Assimilation of SEVIRI
- Assimilation of RADAR
- Assimilation of GPS
- ...

- What can we expect from this for the next 7 years?

# What would we like to reach?

- Discussion!