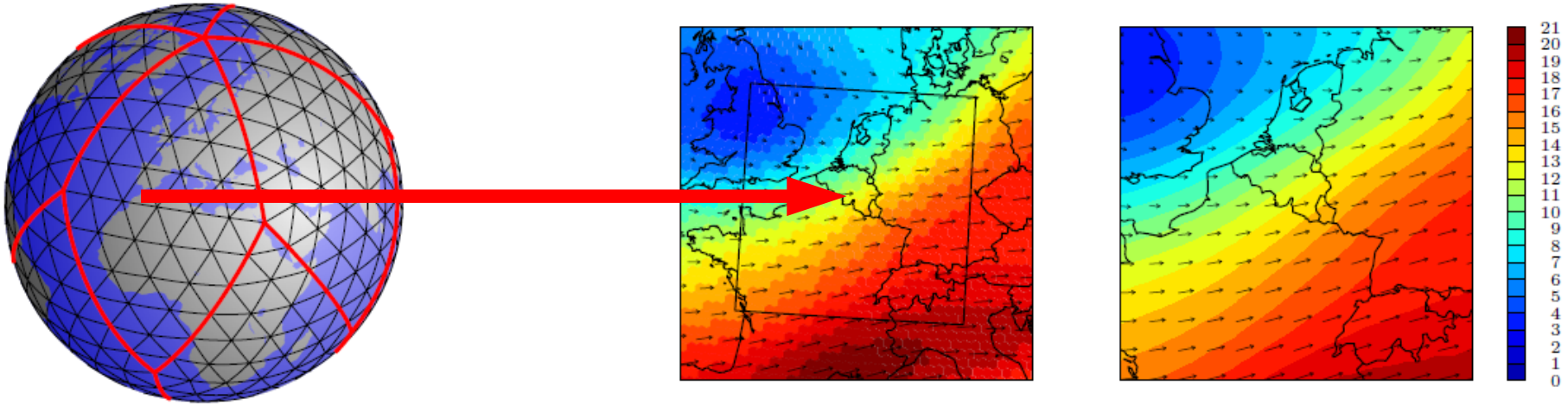
ALADIN

P. Termonia

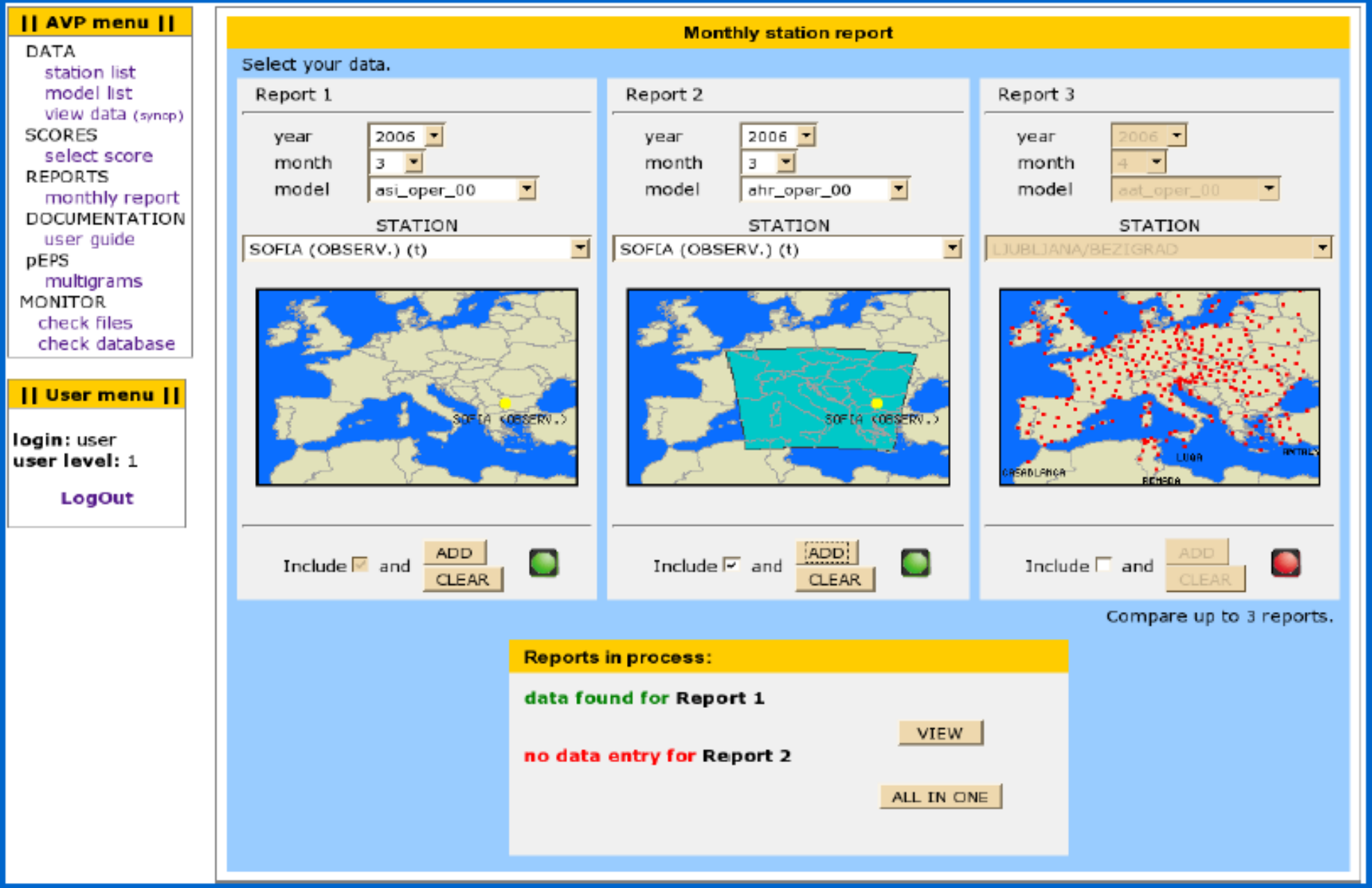
Relevant ALADIN-related points for EWGLAM

- Interoperability (SRNWP-I): ALADIN/HIRLAM made the adaptors working, HOWEVER one should raise the question of the future maintenance of the adaptors!
- Verification:
  - New efforts on our common verification tool.
  - Development of a common verification package for EPS for all the ALADIN partners, currently based on the R-package.
  - Our model is validated by climate runs: convection-permitting parameterization improves the climatology of precipitation extremes of our model!
- (SRWNP-)EPS systems: The LAM community adds forecast skill *on top of* ECMWF. This is proven with the combined GLAMEPS-LAEF system. There is a crucial role of the surface in creating spread which is an argument for multi-model/multi-physics approaches.
- Quo vadis dynamical cores:
  - Progress in extending our spectral core to FE on an A grid. Very have strong indications that is should be possible, which makes the strategic discuss less speculative!
  - What is best: Spectral SI SL vs. grid-point split implicit? C-SRNWP could be the proper vehicle for organizing interconsortia tests and if it is correctly coordinated (e.g. between ET dyn and ET system), we could all benefit.
- Data assimilation:
  - Radar data assimilation is highest priority, but slow (discussions about data formats and convertors)
  - Surface data assimilation: first tests with a combined 3Dvar and EKF have been carried out.

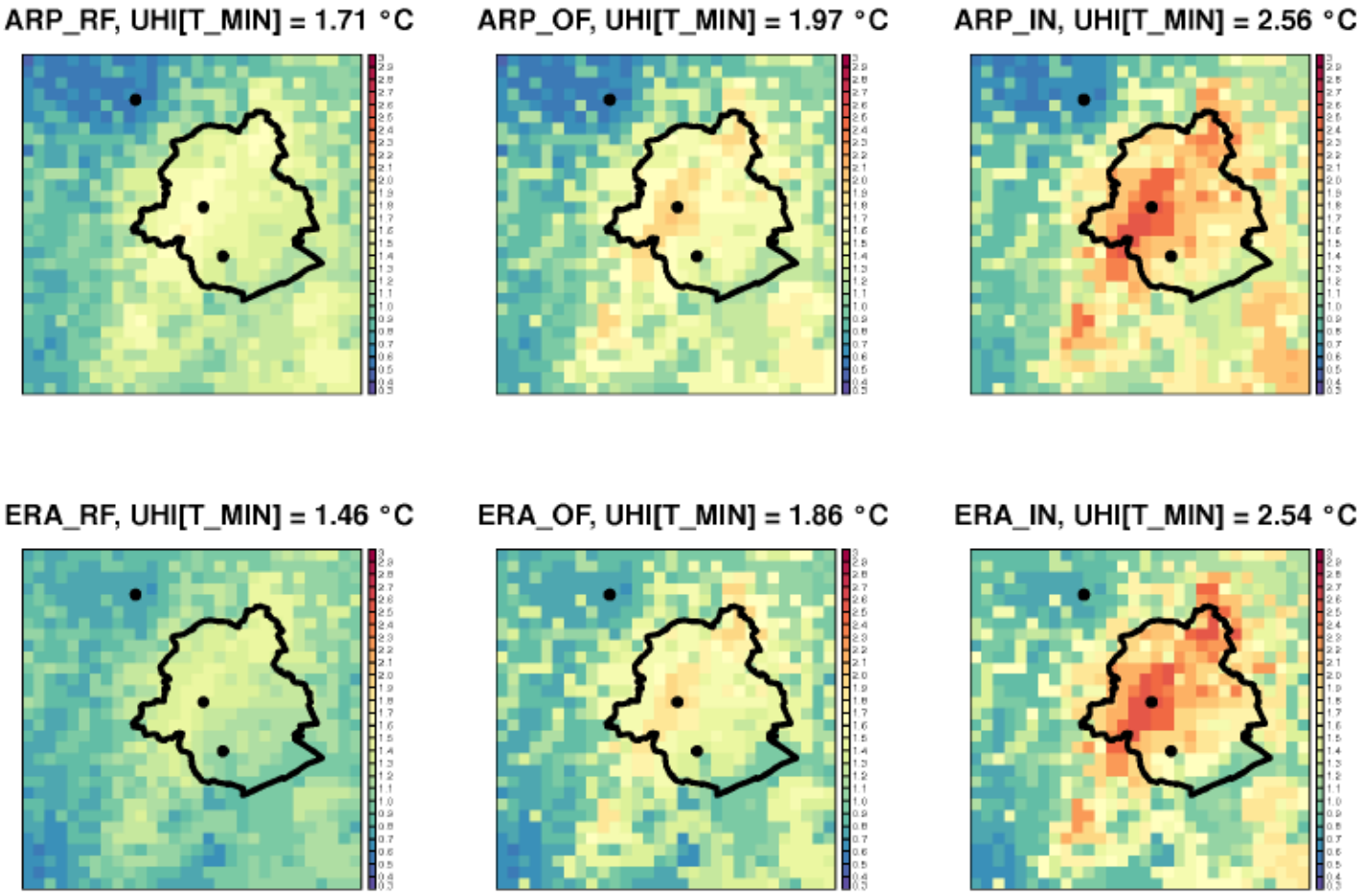
Example adaptors
working code for the icosahedron
Degrauwe's trick



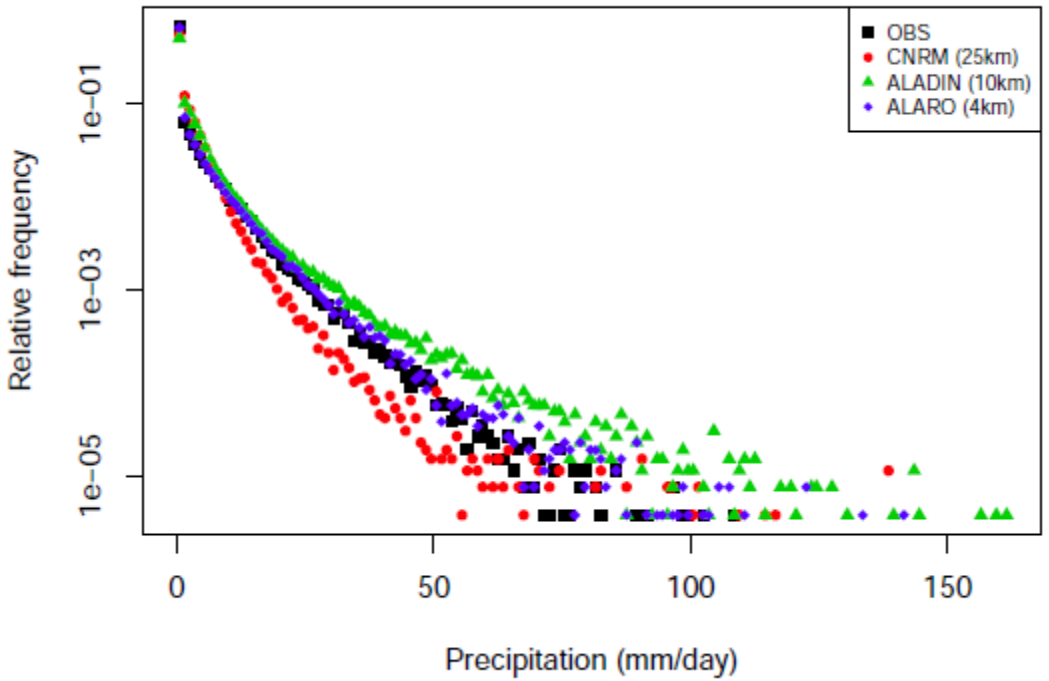
Monthly report - selection



Switch on Town Energy Budget (TEB) and run off line (middle) and in line (right) vs. no TEB (left): Tmax and Tmin 1961-1990 Brussels

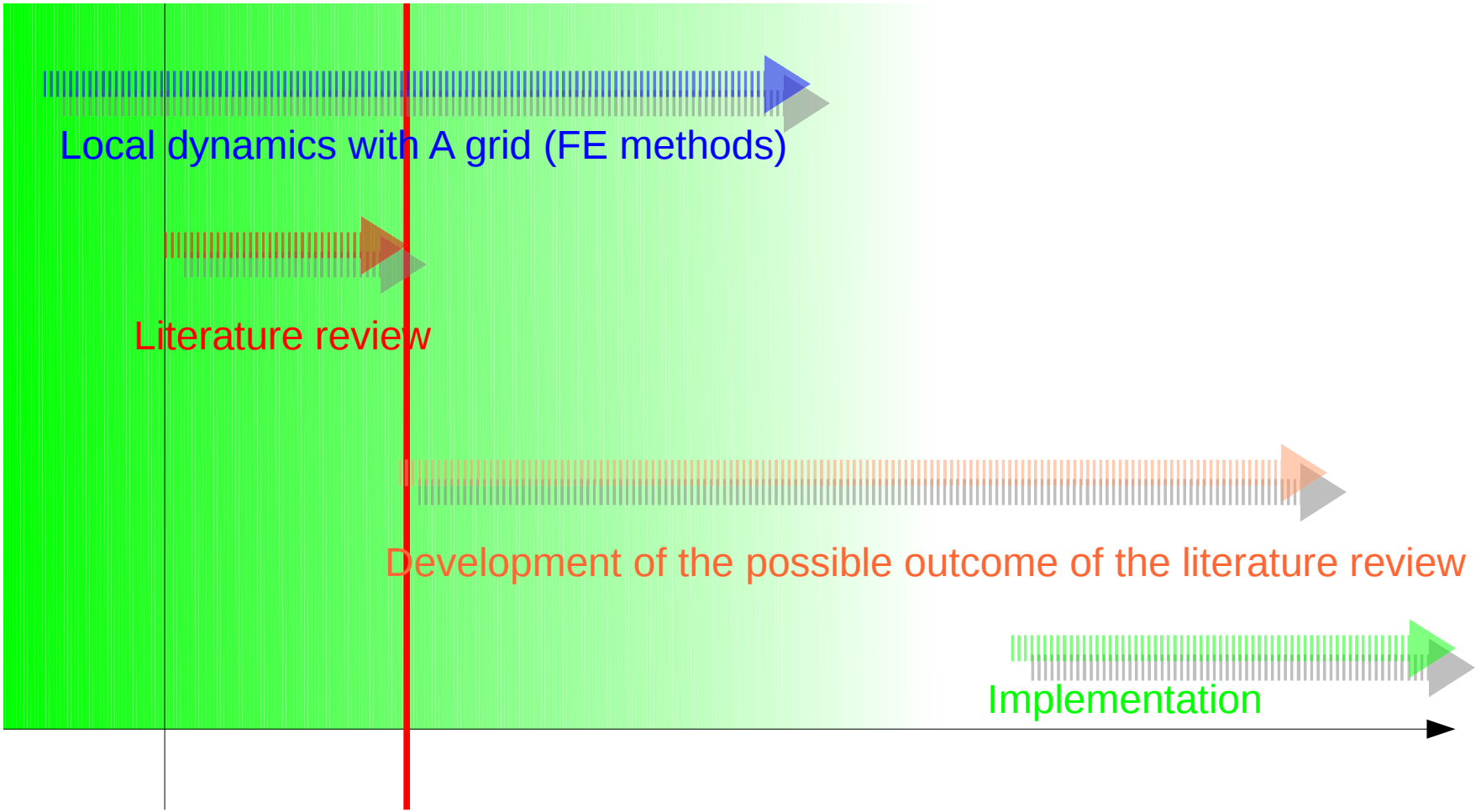


Validation of ALARO developed in NWP in a downscaling of ERA-40 (1961-1990)



- Relative frequency of precipitation events from downscaling of ERA-40 for the last 30 years compared to observations (black)
  - The older ALADIN version at 10-km resolution (green)
  - ALARO at 4 km (blue)
- **Conclusion: the work in NWP to go to higher resolution payed off by a better climatology, including the one of extreme events (cfr. Floodings).**
- **This is a posteriori a validation of our NWP model!**

Dynamics: road map presented to our GA



Eliminitating the A grid means we have to overhaul the whole system.
We stay with the current system at least for the term of the current strategy plan (green area).

IFS dynamical core is **spectral**

Results in **efficient diagonal solver for SISL**-approach of primitive equations BUT

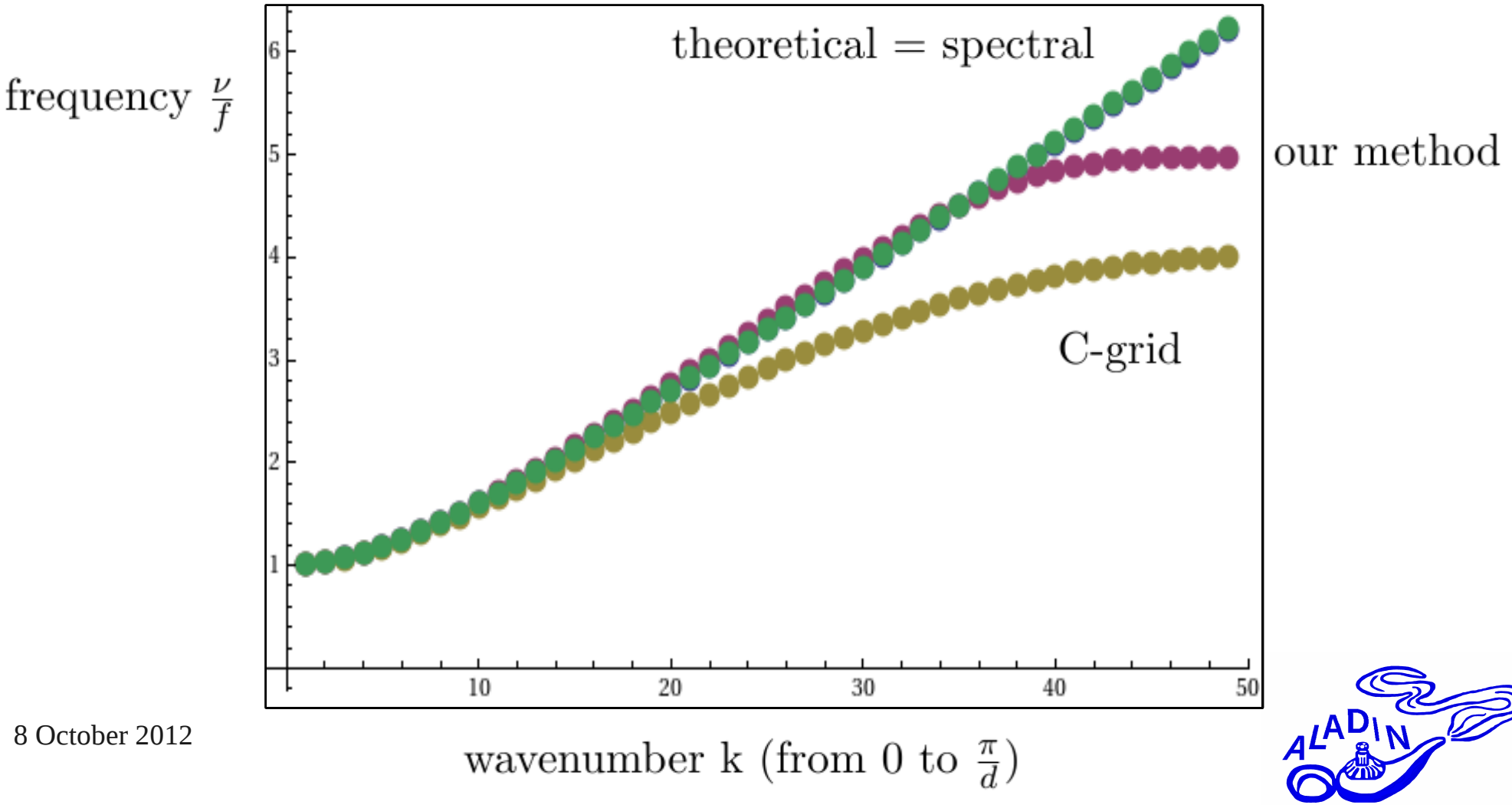
- transformations needed to gridpoint space for non-linear terms, physics,...
- spatial variations (e.g. orography) in basic state → diagonal character solver lost
- Gibbs phenomenon

→ Those drawbacks seem to become worse with increasing resolution...

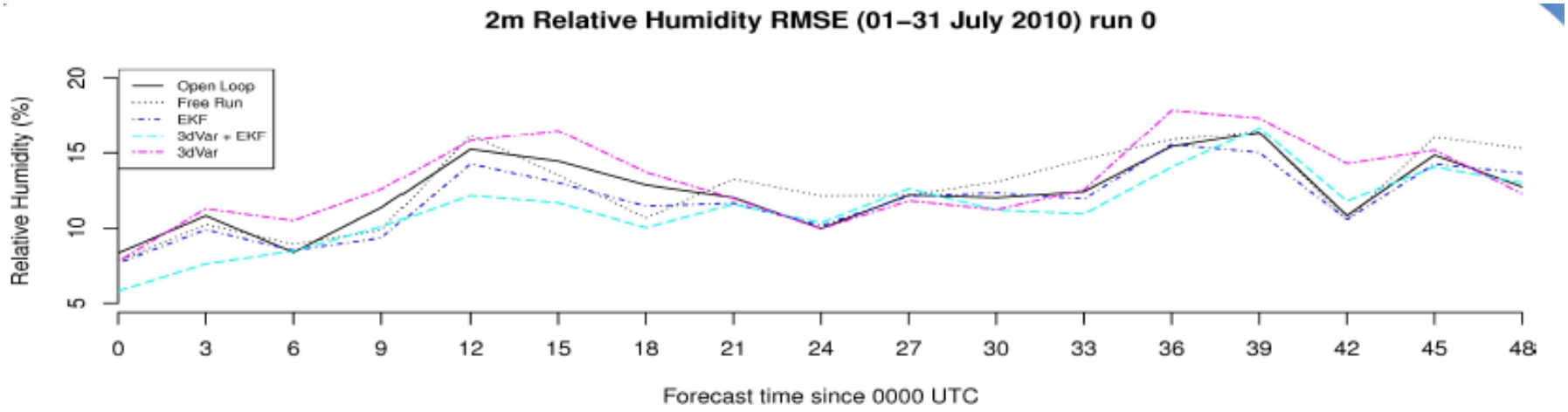
… so we are looking for **a more localized spatial discretisation** technique **to plug into our current IFS-timestep organisation**

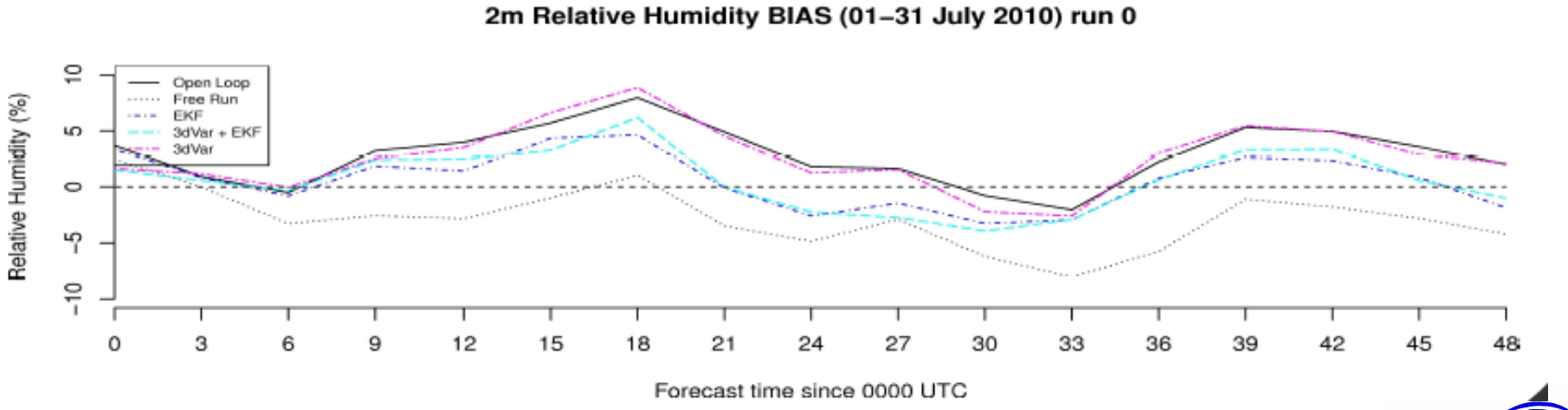
We are working on a **finite element based method on an A-grid**

Be careful for the dispersion properties of inertia-gravity waves and inertia-Lamb waves



First result with SURFEX DA: 3Dvar + EKF





So main points for this week (as I see it)

- Maintenance of the SRNWP-I adaptors?
- C-SRNWP, as an opportunity for the future evolution of our dynamical cores?
  - To be clear **the aim is not to develop a new core together**! But rather to design scientifically based intercomparison tests (avoid beauty contests!) to find resources in Europe.
  - Could create a large critical mass in Europe (w.r.t. To our HPC users)
  - Might give the Dynamics ET a new incentive.