
COSMO NWP meteorological suite: first tests with 2.8 km resolution

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Outline

- **Introduction to COSMO NWP meteorological suite**
- **Present status and possible modifications**
- **Final remarks**

Goals of PT - NWP suite (from last year GM)

- Build up a software environment to perform carefully-controlled and rigorous testing
 - ➔ calculation of verification statistics for any COSMO model test – version
- Offer necessary information on the model forecasting performance
- Provide the COSMO community with standards against which the impacts of new developments in the model should be evaluated
- Benchmark to monitor the progress of mesoscale forecast improvement (periodic testing as COSMO evolves)

Present status of the suite (installed at ECMWF)

- The suite runs the present version of COSMO (e.g v5.0) and the new one (e.g. v5.1) for 2 months.
- Both initial and boundary conditions are provided by ECMWF IFS (no nudging):

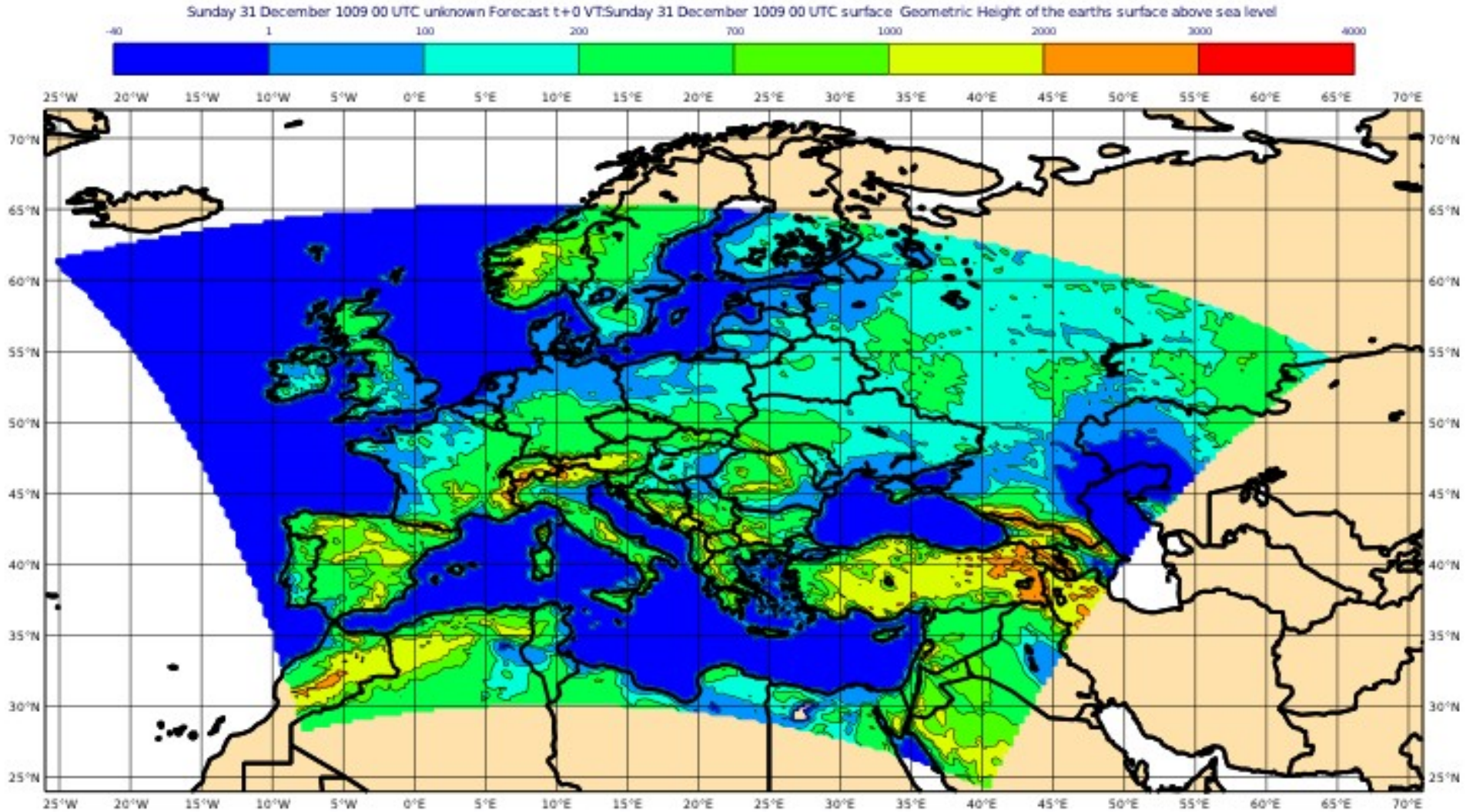
IFS → COSMO_7

- Intercomparison period:

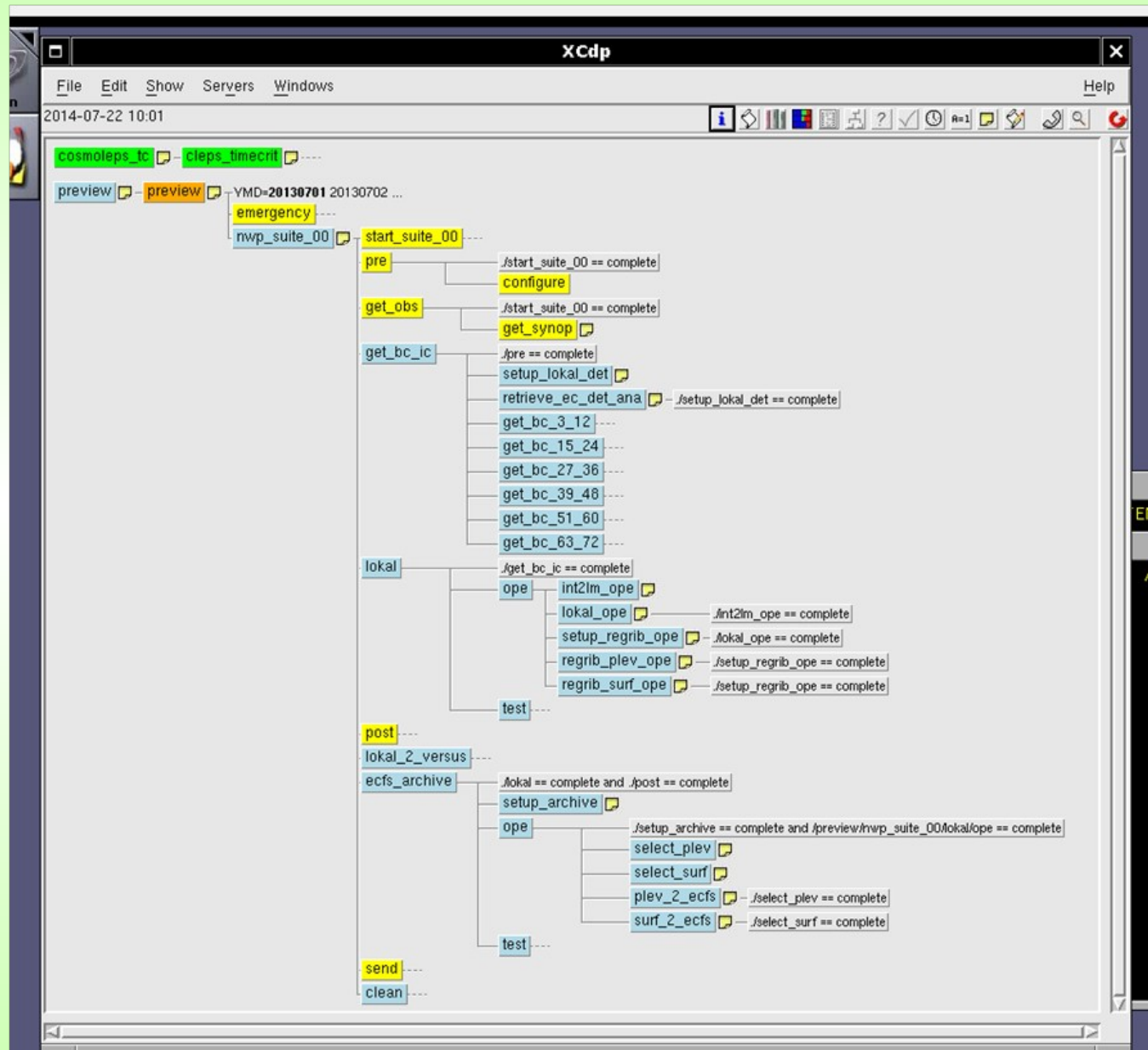
January 2013 and July 2013

- Output fields are then provided to Versus (also installed at ECMWF) for the comparison of the 2 model versions with the computation of scores and plots.

PT NWP METEOROLOGICAL TEST SUITE: integration domain (from last year)



Screenshot of the suite with its main families/tasks



Extension to higher resolution?

Most (all?) of COSMO development is devoted towards the improvement of the model at the convection-permitting scale (below 3 km of horizontal resolution).

==> It makes sense to compare the skill of the new model versions at such resolution.

Need to consider the extension to 2.8 km

There are (at least) two options for the implementation of the high-resolution part:

Option A: **IFS** → **COSMO_7** → **COSMO_28**

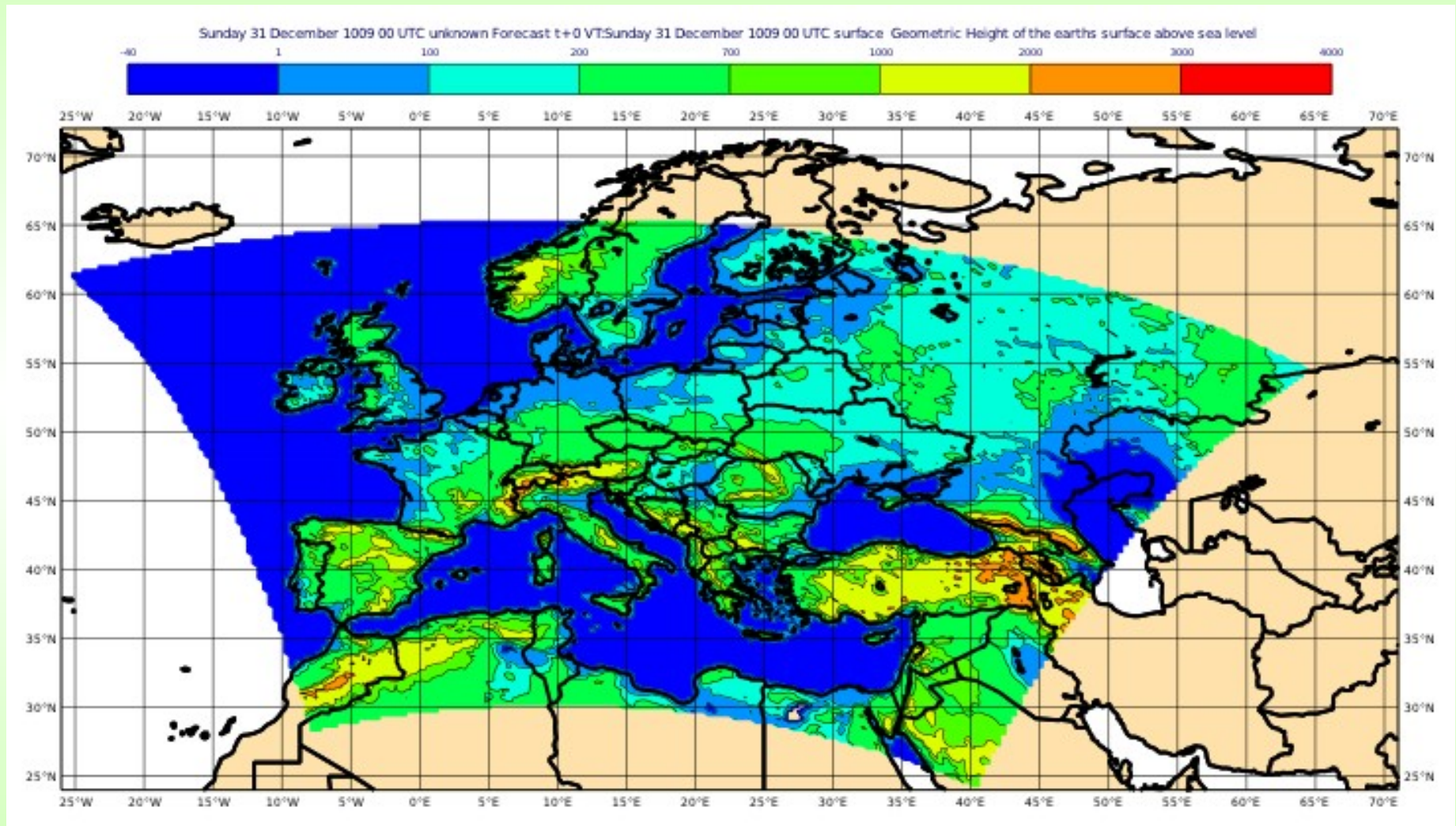
Option B: **IFS** → **COSMO_28**

ECMWF IFS: ec_nx=801; ec_ny=401; 137 ML; ec_dlon=ec_dlat = 0.125 (**14 km**);
fc+72h

COSMO_7: ie_tot = 745 ; je_tot = 569; 40 ML; dlon = dlat = 0.625 (**7 km**); fc+72h

COSMO_28: ie_tot = 1799 ; je_tot = 1369; 50 ML; dlon = dlat = 0.025 (**2.8 km**); fc+48h

Integration domain at 2.8km (almost the same as 7km)



Final remarks

Option A: **IFS → COSMO_7 → COSMO_28**

Option B: **IFS → COSMO_28**

move, anyway, to high resolution

- Option A enables a very comprehensive verification.
- Option A has probably more impact on the “verification” people, as both COSMO_7 and COSMO_28 should be loaded and verified by Versus @ ECMWF.
- Option B is simpler to implement/ maintain.
- Option B is cheaper in terms of needs of computing resources.
- Option B might require a higher-resolution verification network (that we don't have!).

**THANKS FOR YOUR
ATTENTION**