



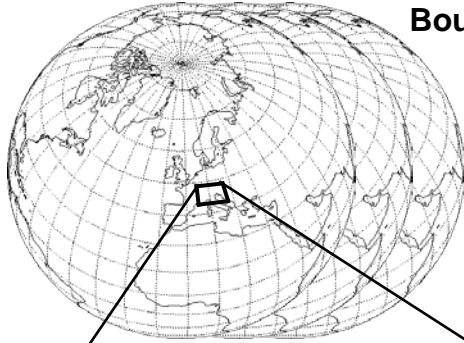
Project COSMO-NExT: Mission statement(s)

- «**COSMO goes kilometre**»
 - pushing ahead the (operational) resolution frontier
 - develop and maintain specific know-how for state-of-the-art modelling over complex topography
- «**COSMO goes ensemble**»
 - embarking on the probabilistic future
 - in-line with COSMO Science Plan
 - making best use of experience at DWD
- «**COSMO goes massively parallel (and/or GPU)**»
→ **Carlos, Xavier**



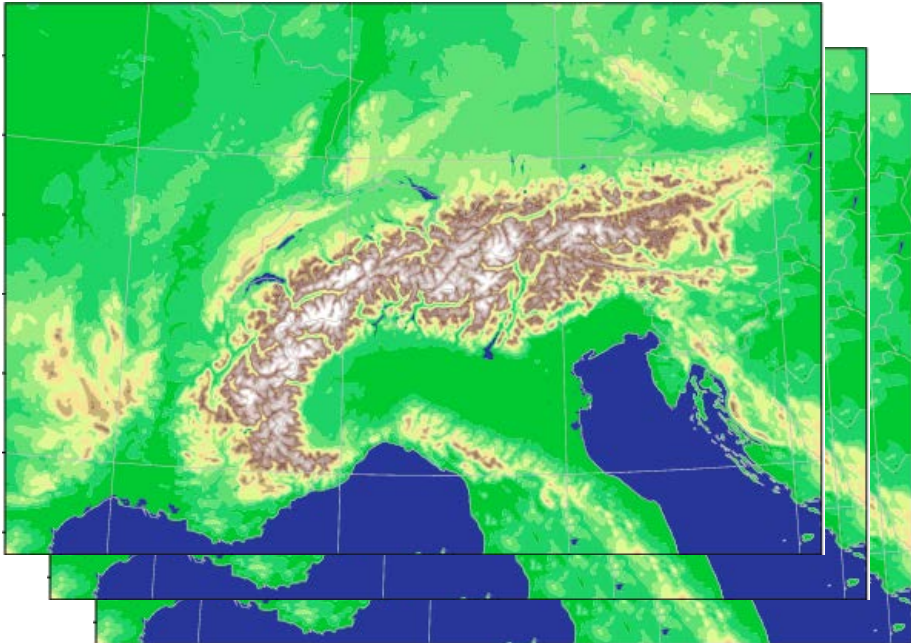
NExT: Novel Expert Tools

Boundary conditions: VarEPS
20km
2x daily

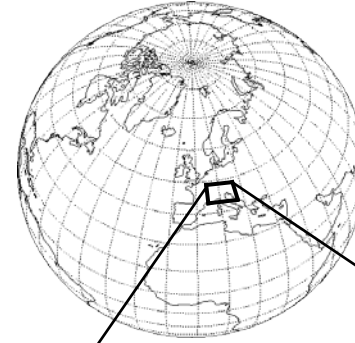


→ Luca

COSMO-E: O(2x) daily O(5 day) forecasts
O(3km) grid size (convection permitting)
O(20) ensemble members

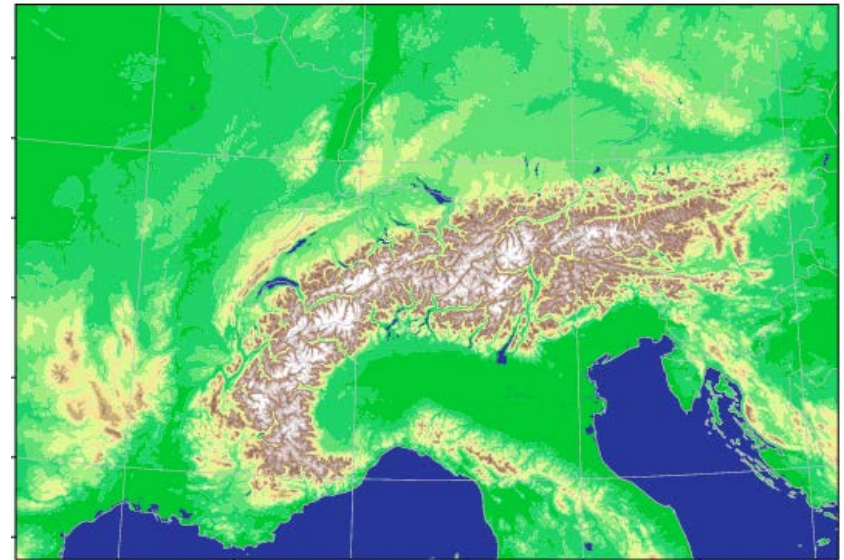


Boundary conditions: IFS
10km
4x daily



→ Guy

COSMO-1: O(8x) daily O(24 hour) forecasts
O(1km) grid size (convection permitting)





Challenges: many!

- **Ensemble-based data assimilation system (KENDA)**
 - **LETKF**; inflation; ...
- **COSMO-1**
 - ICs: **Downscaled KENDA-Analysis**
 - LBCs: IFS (or intermediate COSMO-x)
 - External parameters: Update where feasible
 - Dynamics and **numerics**: Numerically stable and accurate forecasts with minimally filtered orography and minimal numerical diffusion
 - Physics: Use as many of the new/upcoming options as possible (e.g., FLake, tiles, multilayer snow, urban, ...); look into **turbulence** (advection of TKE, truly horizontal diffusion operator, UTCS, ...); retune microphysics; revisit shallow convection scheme; retune TERRA to new external parameters; change from 1D to (quasi-) 3D if needed; ...
 - Validation and Verification: What, and how ...
- **COSMO-E**
 - Initial conditions; IC perturbations
 - Lateral boundary conditions; LBC perturbations
 - Model errors; **model perturbations**
 - New probabilistic products



Collaboration

- **C2SM research project**
funded, COSMO-1, most likely focussed on turbulence, details to be defined
- **myCOSMO-NExT**
You may define **your case(s) and/or meteorological phenomenon of interest** and will then **receive** a **COSMO-1** run with the latest COSMO-1 test version for your case(s) / phenomenon upon every major update in the modelling system. COSMO-2 runs for the same test cases will also be provided. - **You are then invited to analyse your case(s) and provide feedback to the COSMO-NExT project core team.**
- **Ideas for closer collaboration from your side?**