Météo-France plans for NWP modelling experiments during YOPP-SH

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Outline

- Météo-France model contribution for YOPP-SH
  - NWP configurations: real time or near real time
Current Operational Weather Forecasting system:
a wide range of spatial and temporal scale

NWP systems based on IFS/ARPEGE software developed in collaboration with ECMWF and ALADIN, HIRLAM NWP Consortia.

Global ARPEGE-IFS: forecasts every 6 hours up to 114h. \( dx=7.5 \) km over France, and 35 over Australia

T1198 with stretching factor \( c=2 \). L105 1st level 10m

4DVar Inc Data Assimilation system 135km and 50km

Global ensembles ARPEGE:

EDA : 25 members, 40 km

EPS : 35 members, 10-60 km (Multi-physics: 10 physics)

Cloud Resolving Model AROME over France (1536x1440pts)
5 forecasts per day  \( dx=1.3 \) km, 90 Levels (1st at 5m), dt= 50s (SL)

3DVar Data Assimilation system (RUC1h)

New systems (end 2016): AROME-EPS 2.5 km
12 members with perturbed physics and surface with SPPT method
Some interesting comparisons: DomeC

ERA-I: underestimates the strong stability due to an excess of mixing in the SBL.

ARPEGE-NWP is able to simulate the strong SBL in Antarctica.
ARPEGE global model configuration for YOPP-SH SOP

Specific 4DVar ARPEGE T1198 with the stretching pole at DomeC c2.2 → $dx=7.5$ km around DomeC and all Antarctica. 105 vertical levels with the 1st level at 10m

ARPEGE-NWP
stretched over France

Specific ARPEGE-SH
stretched over Dome-C

(only 1 point over 8 shown)
ARPEGE global model configuration for YOPP-SH SOP

Specific 4DVar ARPEGE T1198 with the stretching pole at DomeC c2.2 \( \rightarrow \) \( dx=7.5 \text{ km} \) around DomeC and all Antarctica. 105 vertical levels with the 1\text{st} level at 10m.

ARPEGE-NWP
stretched over France

Specific ARPEGE-SH
stretched over Dome-C

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Possible several domains with AROME @ 2.5km or 1.3Km

For YOPP-SH, AROME (non-hydrostatic model) will use analysis and LBC from ARPEGE-YOPP-SH. Possible options for AROME: 90L, 1st level at 5m.
Summary

- The use of additional observation (RS, T2m from AWS) in the 4DVar is possible in the operational system ARPEGE or in ARPEGE-YOPP-SH if available on GTS.
- ARPEGE-YOPP-SH will be available 1 or 2 days later (near real time). Forecast length will be 120h but can be extended up to 10 days.
- OSE possibly run after YOPP-SH, depending on resources.

- For AROME-SH configuration: several small domain @1.3Km for 5-10 sites observations would be more interesting than a larger domain @2.5km.