The NWP systems at Météo-France

New HPC at Météo-France

2 twin HPC, 2 implementations

- Centre National de Calcul
- Espace Clément Ader

Computer Belenos

Belenos/Tarantis - ATOS BULL Sequana XH2000

- 10.39 Pflops peak performance
- 4DVar (6h cycle): Tl224c1 L 105 & Tl499c1 L 105
- 5 forecasts per day up to 48h

Computer Tarantis

Operational or Research

ARPEGE-EPS (PEARO)

1.33m (1536 x 1640 pts)
- 16 members
- 3DVar (1h cycle)

ARPEGE-EDA (AEARO)

1.33m (1536 x 1640 pts)
- 25 members
- 3DVar (1h cycle)

ARPEGE-France Deterministic

1.33m (1536 x 1640 pts)
- 5 forecasts per day up to 48h

ARPEGE Over (5 domains)

2.5km L90 – Dynamical adaptation of IFS (altitude) and Arpege (surface)
- 4 forecasts per day up to 48h

ARPEGE-EPS (PEARO)

- Four times per day up to 5th
- Initial and boundary conditions from PEARP
- Ref: ALADIN-HIRLAM Newsletter n°9 Jan 2017

ARPEGE-EDA (AEARO)

- Female L90– Dynamical adaptation of IFS (altitude) and Arome-Fr (surface)

During 2020 and the first quarter of 2021, several upgrades of operational suites: from cy43t2_op3 (January 2020) to cy43t2_op8:

- New observations, in particular data from the satellites Metop-C, GOES17, ADM-Aeolus; new GPS-RO satellites, new providers for airplane data to mitigate the decrease of their number
- Many technical adjustments for observations dataflow
- Upgrades of surface: snow analysis in Arome, bugfix of SST initialization near the coastlines
- And some others….

February 2021:
- Operational suite on new HPC BULL-AMD: cy43t2_op8

E-suite cy46t1_op1

Calendar: currently building in GMAP, formal real-time e-suite from June 2021 for a put into operations expected by Q1 2022.

Few highlights (among many others):

- EPS systems reach the same resolutions than their deterministic counterpart (arpege) e-suite
- Changes in physics
- # arpege: Tiedke deep convection scheme, use of SRTM for solar radiation
- # arpege/arome: Ecume v6 air/sea flux parametrisation
- Coupling with 1d sea-ice model
- All-sky assimilation of microwave data from MHS and ATMS
- Snow analysis
- Change of Arome dynamics to improve moist convection:
- Upgrade of horizontal resolution of the Arome-Overseas models

Global operational NWP systems based on ARPEGE

ARPEGE-Deterministic

- 2.2km L90 (5km on W Europe)
- 4DVar (6h cycle): Tl1198c2.2 L 90 (7.5km on W Europe)
- 5 forecasts per day up to 114h

ARPEGE-EDA (AEARO)

- 2.2km L90 (5km on W Europe)
- 5 forecasts per day up to 114h

ARPEGE-EPS (PEARO)

- 2.2km L90 (5km on W Europe)
- 3 forecasts per day up to 114h

Global operational NWP systems based on AROME

AROME-France Deterministic

- 1.33m (1536 x 1640 pts)
- 5 forecasts per day up to 48h
- 3DVar (1h cycle)

AROME Overseas (5 domains)

- 2.5km L90 – Dynamical adaptation of IFS (altitude) and Arpege (surface)
- 4 forecasts per day up to 48h

AROME-France Nowcasting

- 2.5km L90 – Dynamical adaptation of IFS (altitude) and Arpege (surface)
- 4 forecasts per day up to 48h

AROME-EPS (PEARO)

- 2.2km L90
- 16 members
- 4 forecasts per day up to 48h

AROME-EDA (AEARO)

- 2.2km L90
- 25 members
- 4DVar (1h cycle)

AROME-IFS

- 2.2km L90 – Dynamical adaptation of IFS (altitude) and Arpege (surface)
- 2 forecasts per day up to 48h

Météo-France Numerical Weather Prediction Systems

Regional operational NWP systems based on AROME

Operational upgrades (2020-2021) and 2021 e-suite cy46t1_op1

- New physics packages
- 10 physical packages
- Fourier (3D) and Singular vectors
- Operational upgrades (2020-2021) and 2021 e-suite cy46t1_op1

- Operational suites: (March 2020) to cy43t2_op8

- New observations, in particular data from the satellites Metop-C, GOES17, ADM-Aeolus; new GPS-RO satellites, new providers for airplane data to mitigate the decrease of their number

- Many technical adjustments for observations dataflow

- Upgrades of surface: snow analysis in Arome, bugfix of SST initialization near the coastlines

- And some others….

February 2021:
- Operational suite on new HPC BULL-AMD: cy43t2_op8

E-suite cy46t1_op1

Calendar: currently building in GMAP, formal real-time e-suite from June 2021 for a put into operations expected by Q1 2022.

Few highlights (among many others):

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