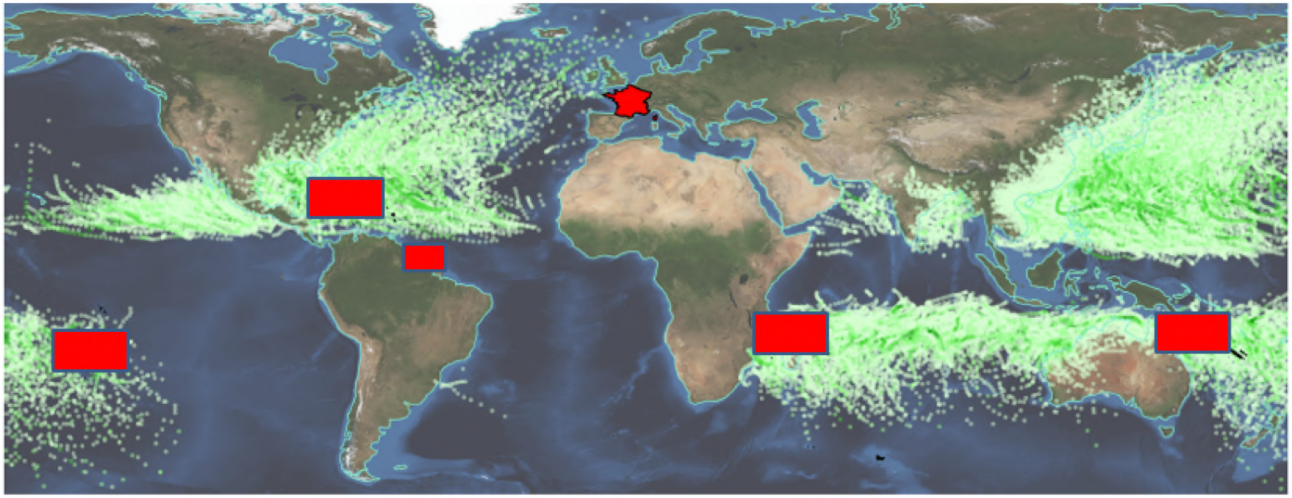
Assembly ACCORD

8th of December 2021
(visio)

Météo-France status and plans

Marc Pontaud and colleagues



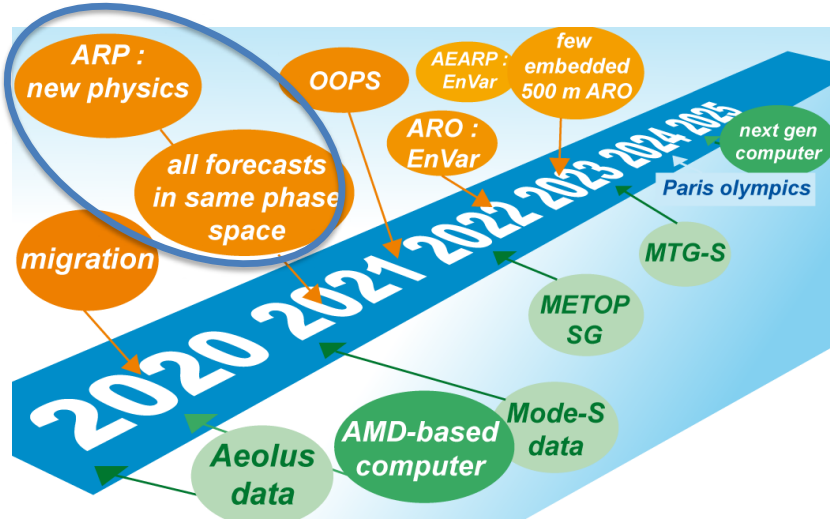
Two key points

New Météo-France hpc

- The two new Météo-France hpc have been installed by the end of 2020 and beginning of 2021
- About 2 x 10 Pflops
- The operationnel suite has been moved on these new hpc, the 2nd February 2021

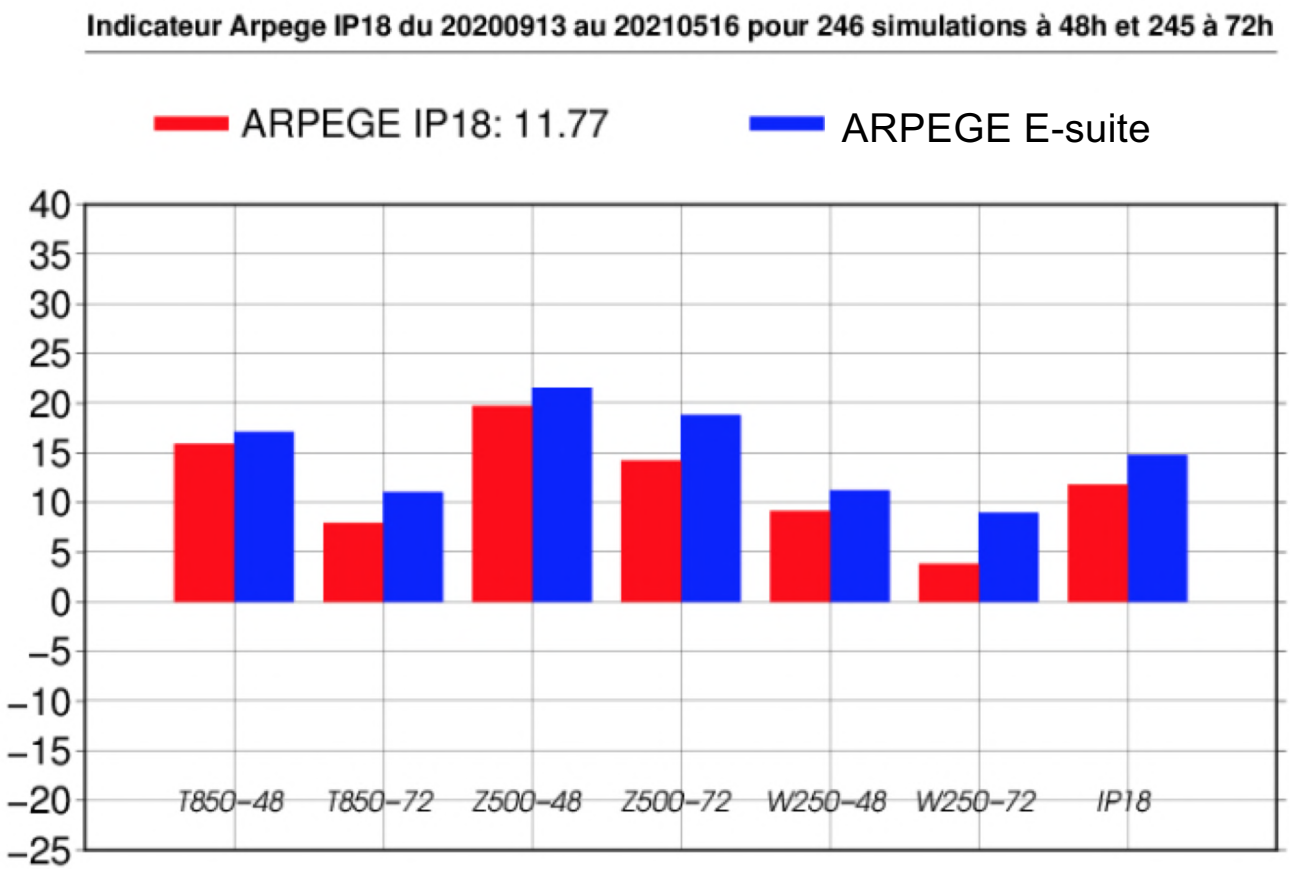
E-suite as the first step of our 2021-2025 implementation plan

- CY46T1_op1 (with RTTOV12 et SURFEX v8.0)
- Starting end of spring 2021
- It has been improved and completed in the following months (EPS)
- New Arpege physics
  - IFS deep convection scheme,
  - a new version of the Ecume oceanic surface fluxes scheme,
  - the SRTM radiation scheme with the solver McIca,
  - the 1D sea ice scheme Gelato
  - changes in the conservation of pseudo-enthalpy



Météo-France e-suite

ARPEGE : general significant improvement



Some points :

- A better diurnal cycle of convection,
- an improvement of the precipitation frequency biases,
- a general improvement of the synoptic elements (deepening) as well as the disappearance of unrealistic cloud arcs over the sea

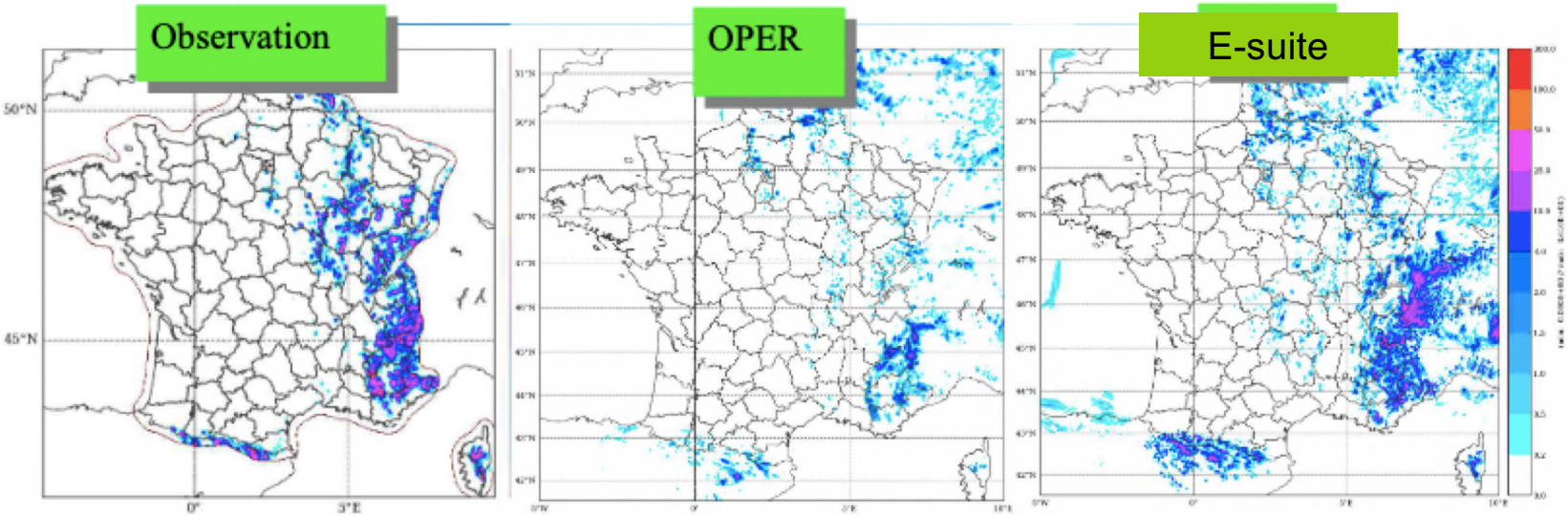
- As coupling model : improves slightly AROME

Météo-France e-suite

Modifications :

- sea-surface fluxes
- Radar observation optimisation
- Scatterometer wind optimisation
- GNSS radio occultation added

Correction of the underestimation of convection



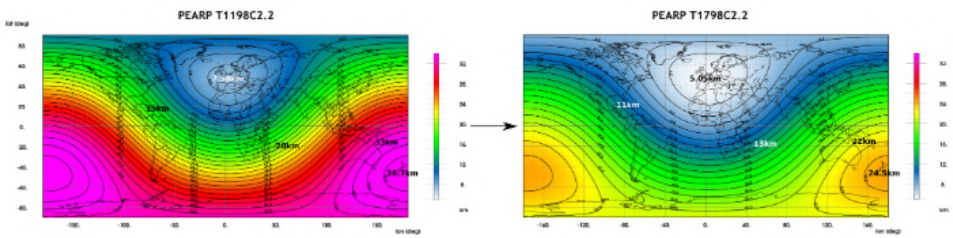
Météo-France e-suite

Alignement of the spatial resolution of the EPS:

- Arpege-EPS (TI1798c2.2L105) with that of the deterministic system Arpege
- Arome-EPS (1.3kmL90) with that of the deterministic system Arome-France

ARPEGE EPS

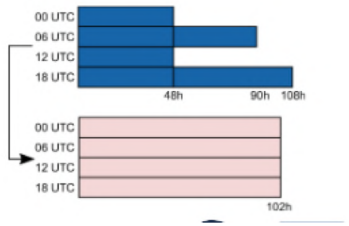
- Résolution horizontale des prévisions :



- Résolution verticale des prévisions : 90 → 105 niveaux
- 34 membres perturbés + ARPEGE déterministe

fournit les conditions aux limites PEARO
(F. Bouttier, L. Raynaud)

- 4 réseaux par jour



AROME EPS

- 16 members + 1 deterministic
- 4 productions per day (up to 51h)
- asoociated with AEARP and coupled with ARPEGE EPS

Positive impact, specifically on precipitation :

- higher resolution
- PEARP e-suite

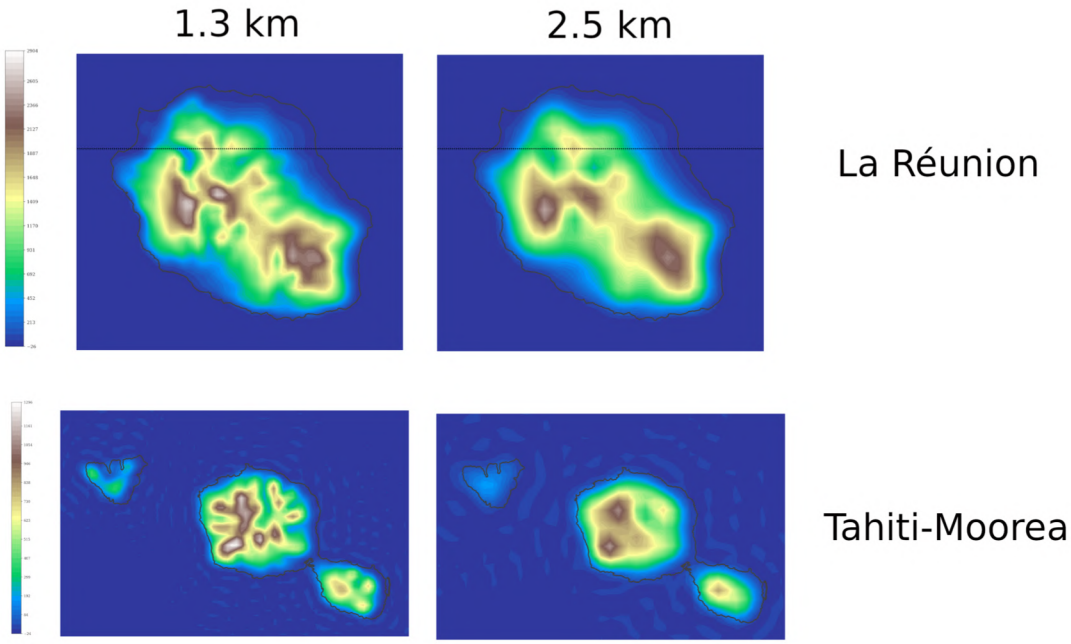
Better rate of détection – heavy rain

Météo-France e-suite

AROME OverSea

Increasing the horizontal resolution of Arome-OM systems (2.5 km -> 1.3kmL90)

32 bits configuration: save 40% of computing time => next step EPS (16 membres)



Météo-France e-suite

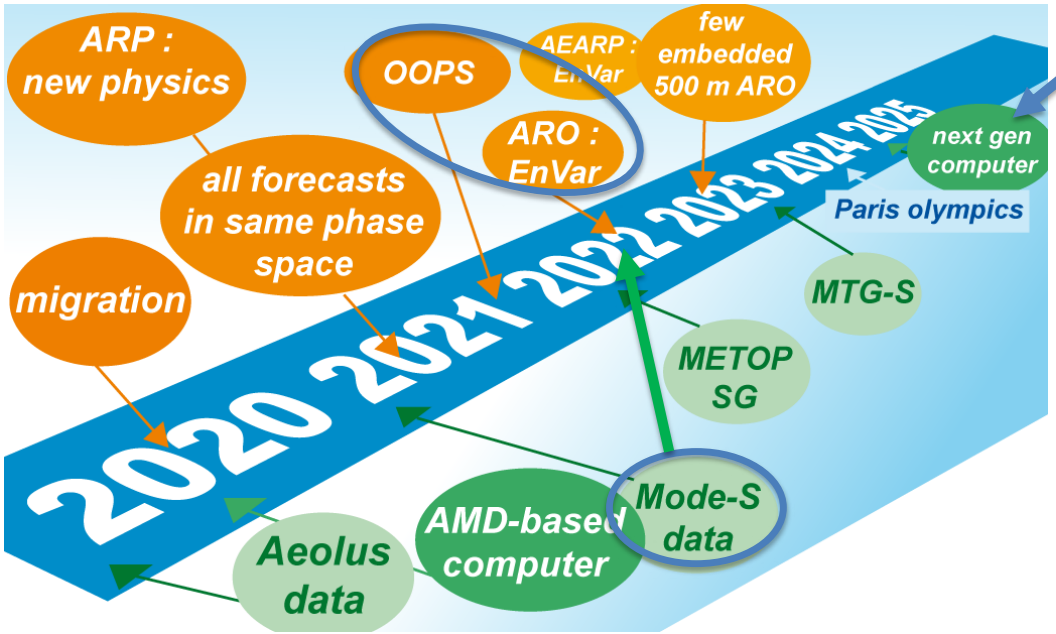
- ***Other technical and scientific evolutions*** *: Assimilation of rainy cloud observations from MHS and ATMS microwave sounders (5 instruments) (1D-Bayesian+4DVar), Assimilation of radiosondes at descent, improved in radar assimilation, SPP scheme in Arpege-EPS, improvements in Arpege-EDA, SPPT in Arome-EDA, linear interpolators for hydrometeors and no SLHD diffusion and new oceanic surface fluxes in Arome, etc.*
- *New diagnostics and outputs (CIN, MLCAPE, lightning density, cloud base/ceiling/top, etc.)*

One year of re-forecasting of the whole E-suite, in particular Arome-EPS and Arpege-EPS, for post-processing

=> Switch to operational : summer 2022

Météo-France plans

Next e-suite CY48T1



Code adaptation on CPU-GPU

⇒ Major issue

Dust in-line in AROME

⇒ A first mock-up by the end of 2022

Paris summer campaign 2022

⇒ Urban modelling

⇒ Hectometric scale

⇒ Olympic Games Paris 2024

Thank you