PROGRESS of the DEMETER SIMULATIONS

At LODYC-IPSL

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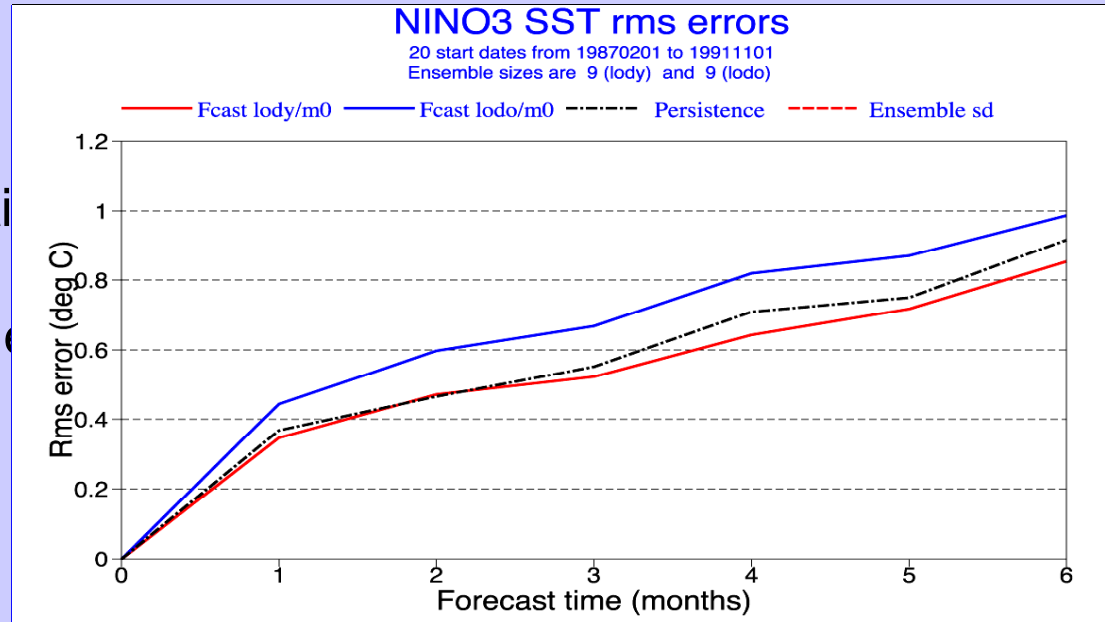
What happened at LODYC since our last meeting

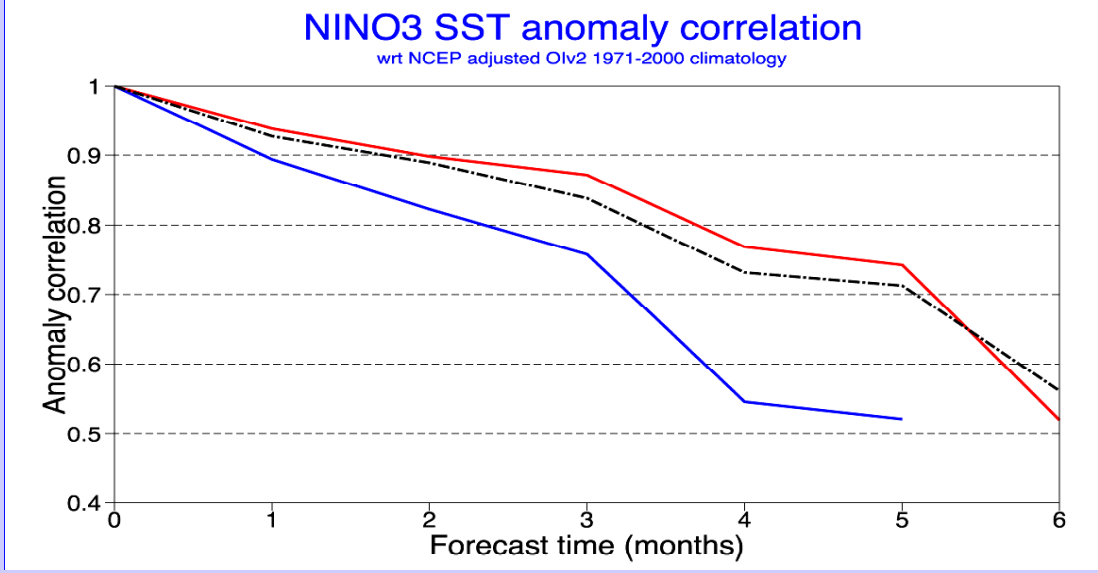
➔ 2 scientific issues :

- impact of initial conditions
- spatial patterns of forecasts dispersion

impact of initial conditions

Our first hindcasts ensemble was worst than persistence (in blue), due to a bug in the initi conditions.
After correction, we now beat the persistence (in red)

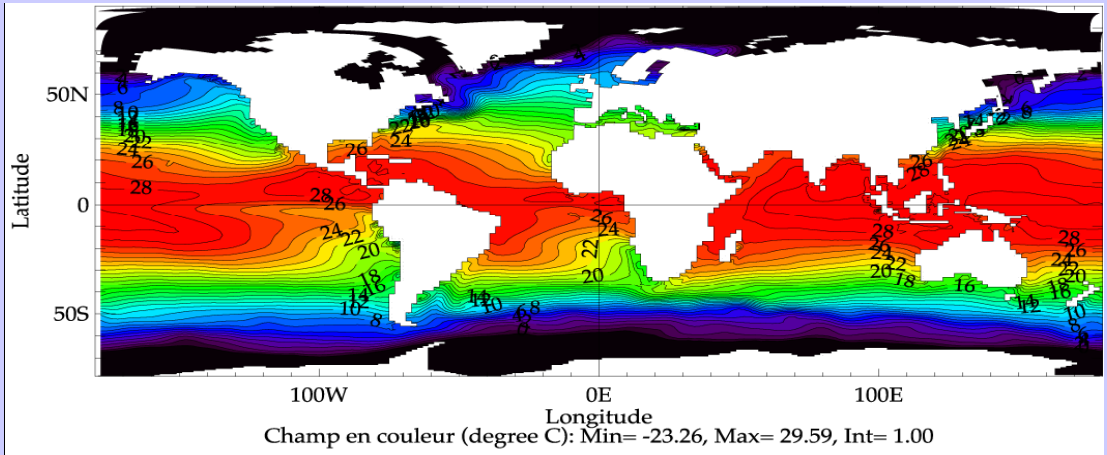




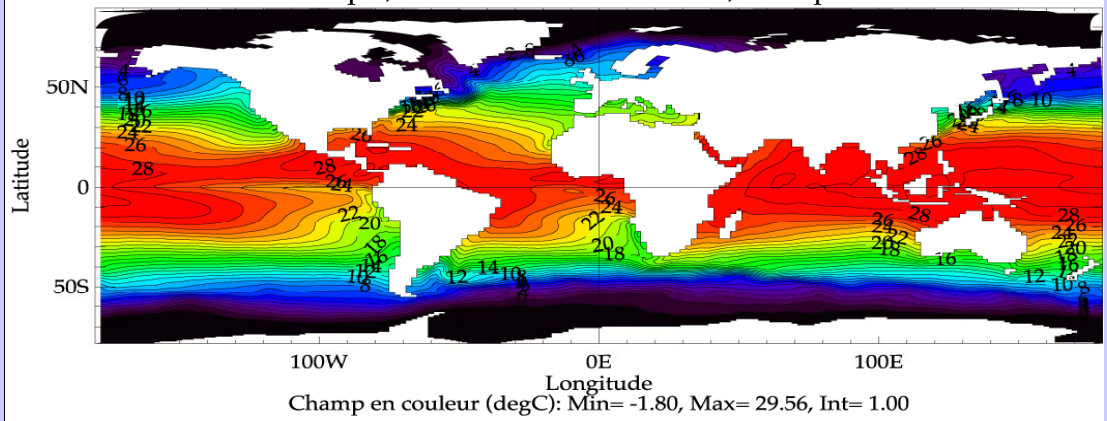
What lesson did we learn from this experience ?

impact of initial conditions

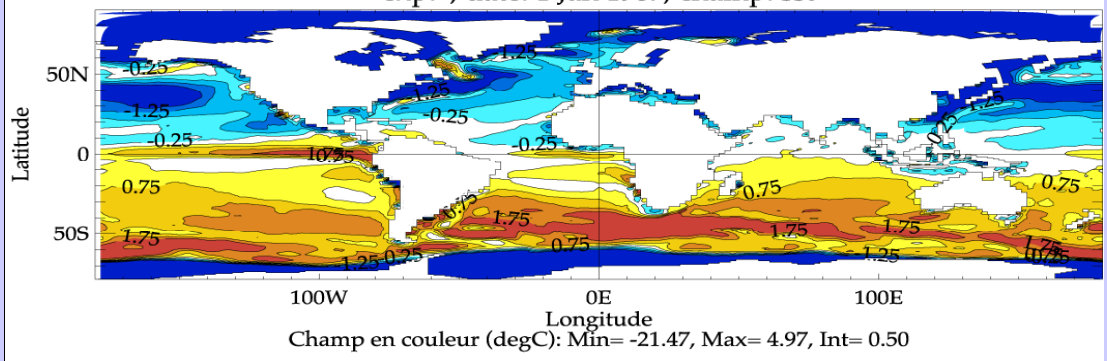
Error was :
1.5° global latitudinal shift
of the initial conditions



exp: , date: 19870101 - 19891228, champ: sst



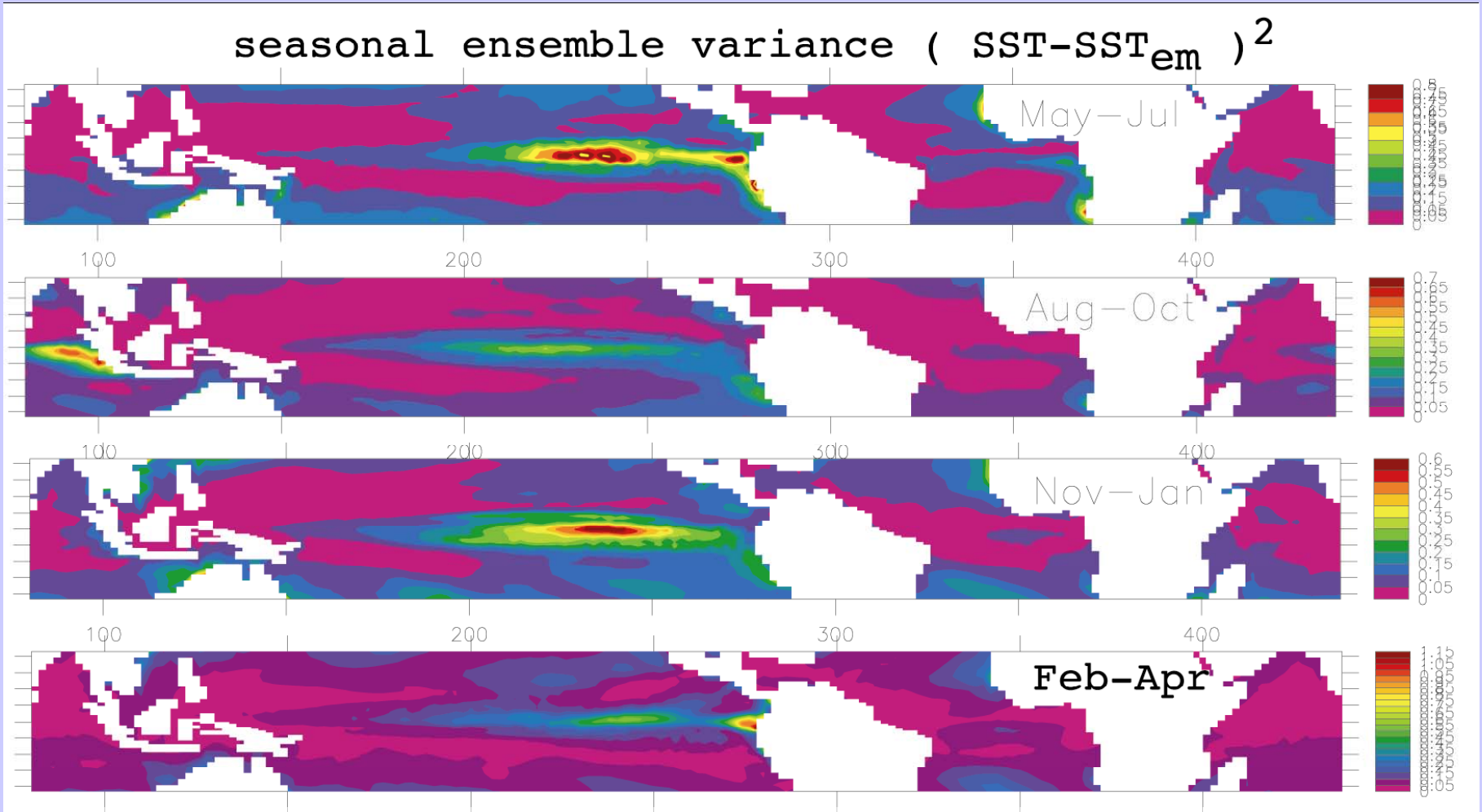
exp: , date: 1 Jan 1987, champ: sst



it was a sub-grid scale error
with respect to AGCM T64 resolution :
shift ~ 1/2 grid size AGCM

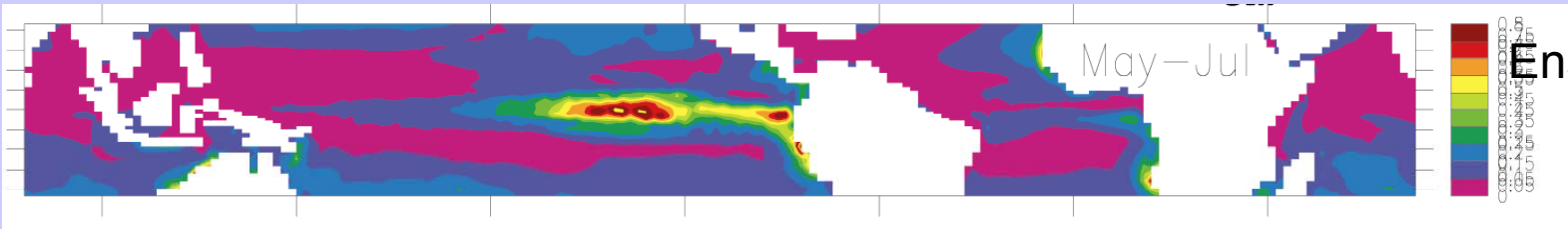
Supports the idea that
it is essential for seasonal prediction
to start with high quality oceanic initial conditions

spatial patterns of forecasts dispersion

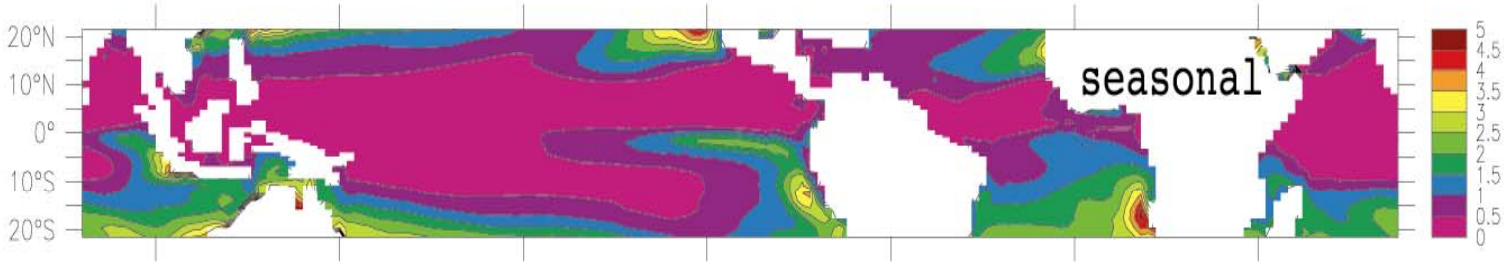


higher dispersion ≡ lower quality forecast,
Is there a simple physical interpretation for these patterns?

spatial patterns of forecasts dispersion

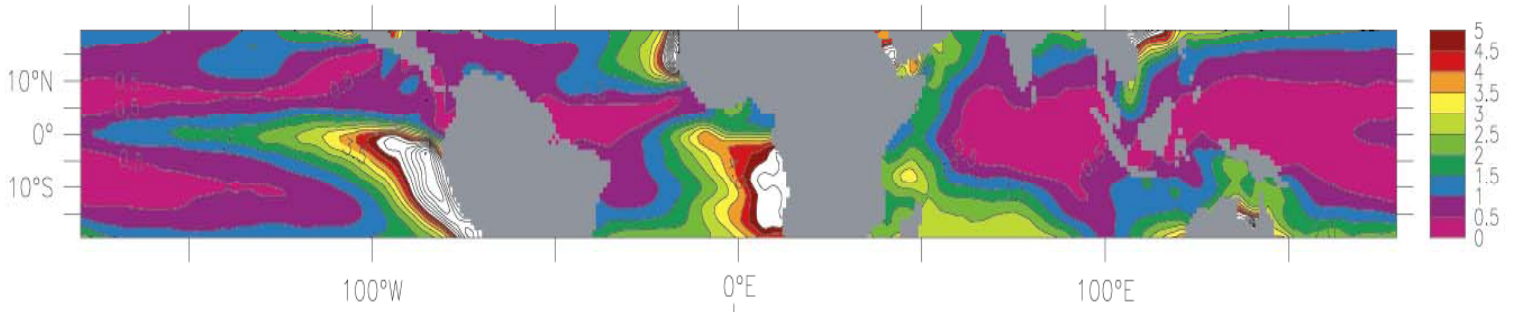


Ensemble dispersion MJJ ←



reference run seasonal dispersion ←

Observations seasonal dispersion ➔



OGCM Upwelling areas ➔

(Blanke et al., 2001)

phenomenon controlling dispersion = tropical upwellings ?

Upwelling areas correspond to
strong (vertical) temperature gradients
➔ stronger effect of forcing changes

Improvement of forecast requires
progress in the understanding/monitoring of these areas.

To answer these questions:

- hindcasts for years 72+
- comparison between models (the ocean group)
- comparison with observations (DEMETER, ENACT)