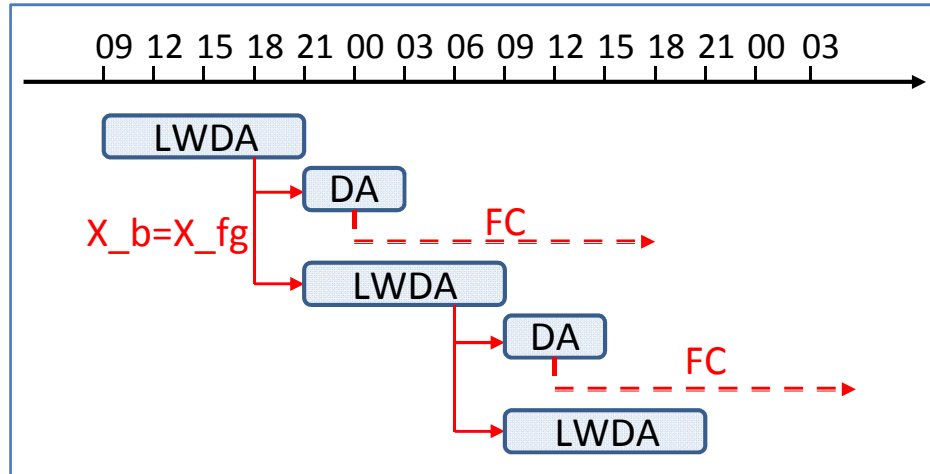# Recent and forthcoming changes in the ECMWF analysis system
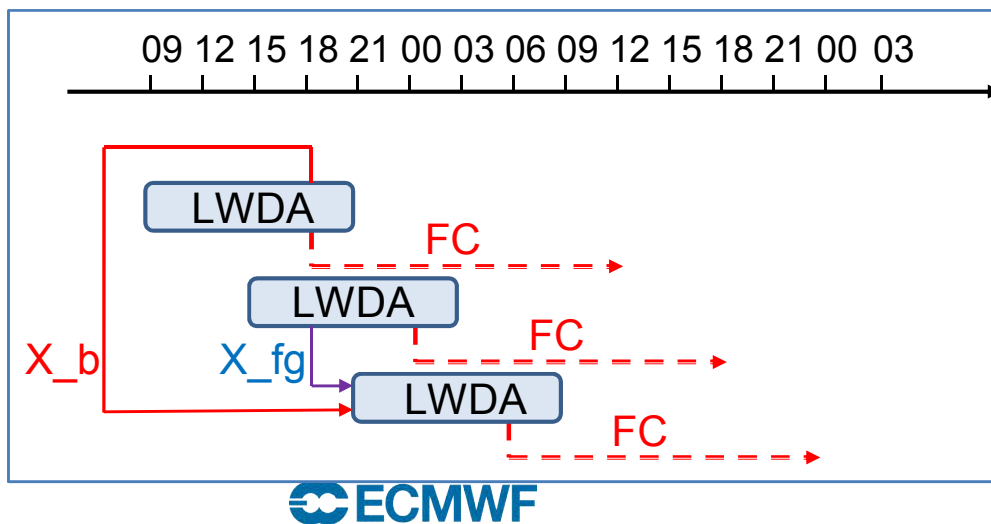
Massimo Bonavita, Elias Holm, Lars Isaksen, Simon Lang

ECMWF

Operational 4D-Var configuration
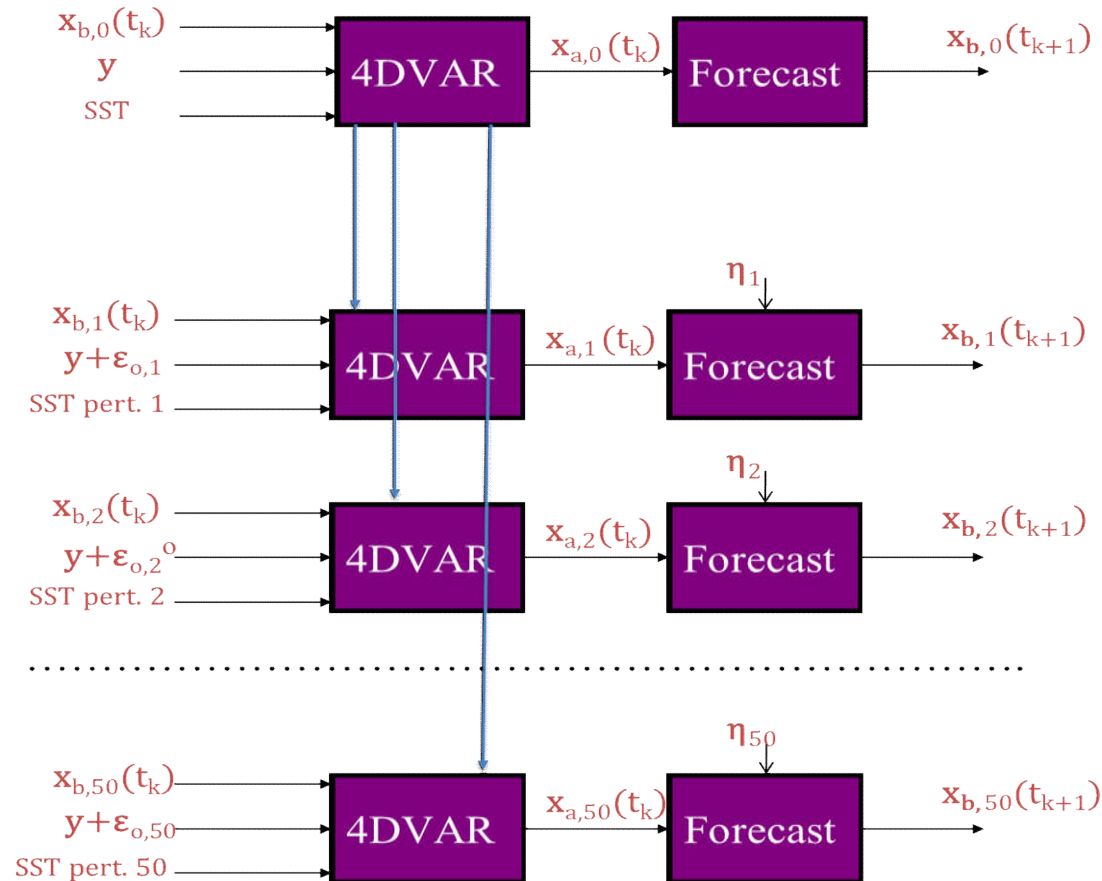
Overlapping window 4D-Var:

1. Suite simplification
2. Improved use of late-arriving obs.
3. More uniform usage of HPC resources during the day
4. Increase effective number of outer loops -> improved handling of nonlinearities in M,H

However, need to fit a 12h 4D-Var inside the time critical path…

Early Delivery

Overlapping window

ECMWF

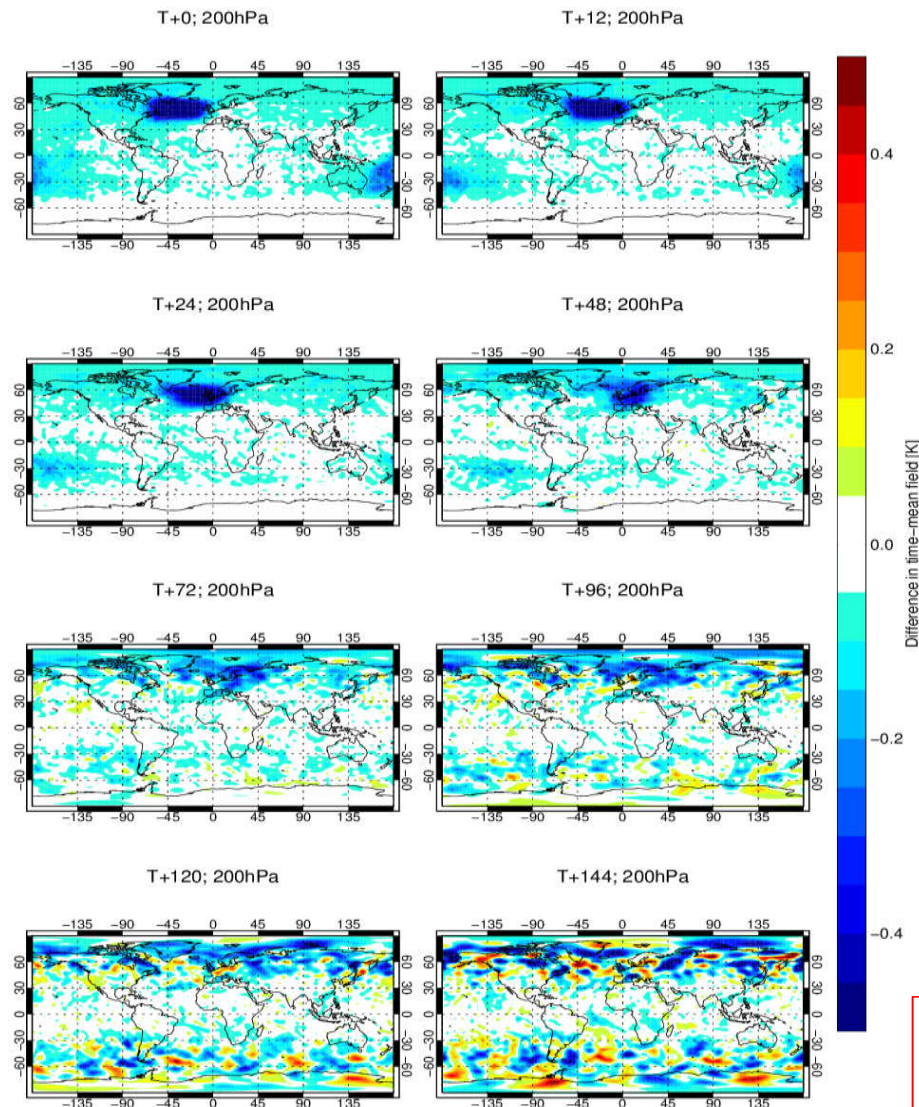# Towards seamless EDA-ENS

1. Overlapping windows -> 6-hourly EDA refresh cycle.
2. Affordable 50 member EDA by re-use of information from the control in perturbed members:
   1. 2nd level preconditioners;
   2. First-guess from control;
   3. Re-centring of EDA members.

Bias correction of aircraft observations

Bias correction of aircraft temperature observations has been extended to AIREP reports. This introduces a 0.5K cooling of the UTLS (plot on left) and generalised improvements to independent observations' BG fit.

Bias correction has also been extended from one to three predictors (cruise, ascent, descent) to better take into account different bias characteristics.

Mean temperature forecast (K) differences at 200hPa averaged over 50 days JJA 2016. Blue contours means the new bias correction cools the atmosphere. .