Data assimilation in Morocco

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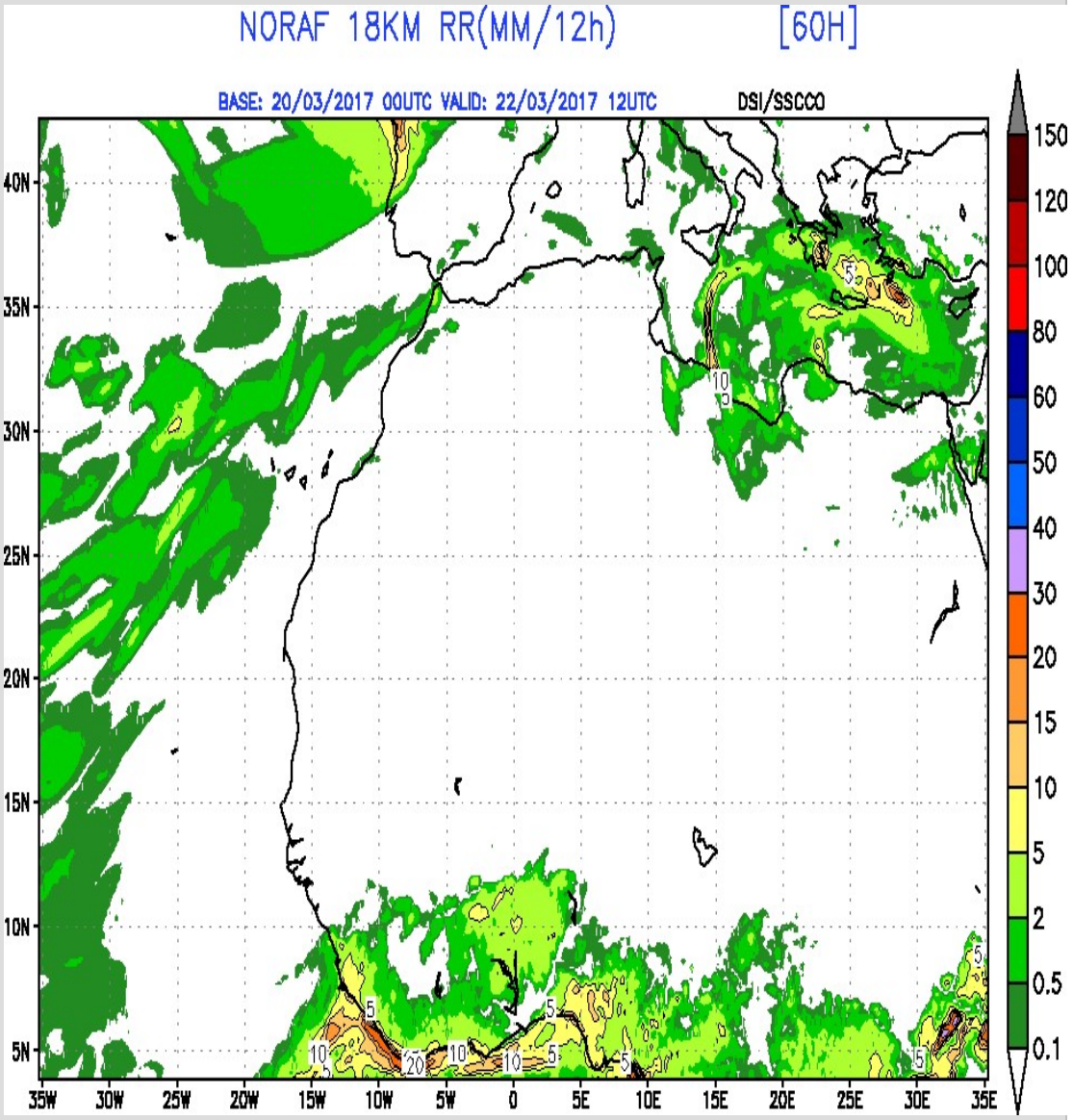
OUTLINES

- Overview on the data assimilation in Morocco
- Main problems
- Plans for the future

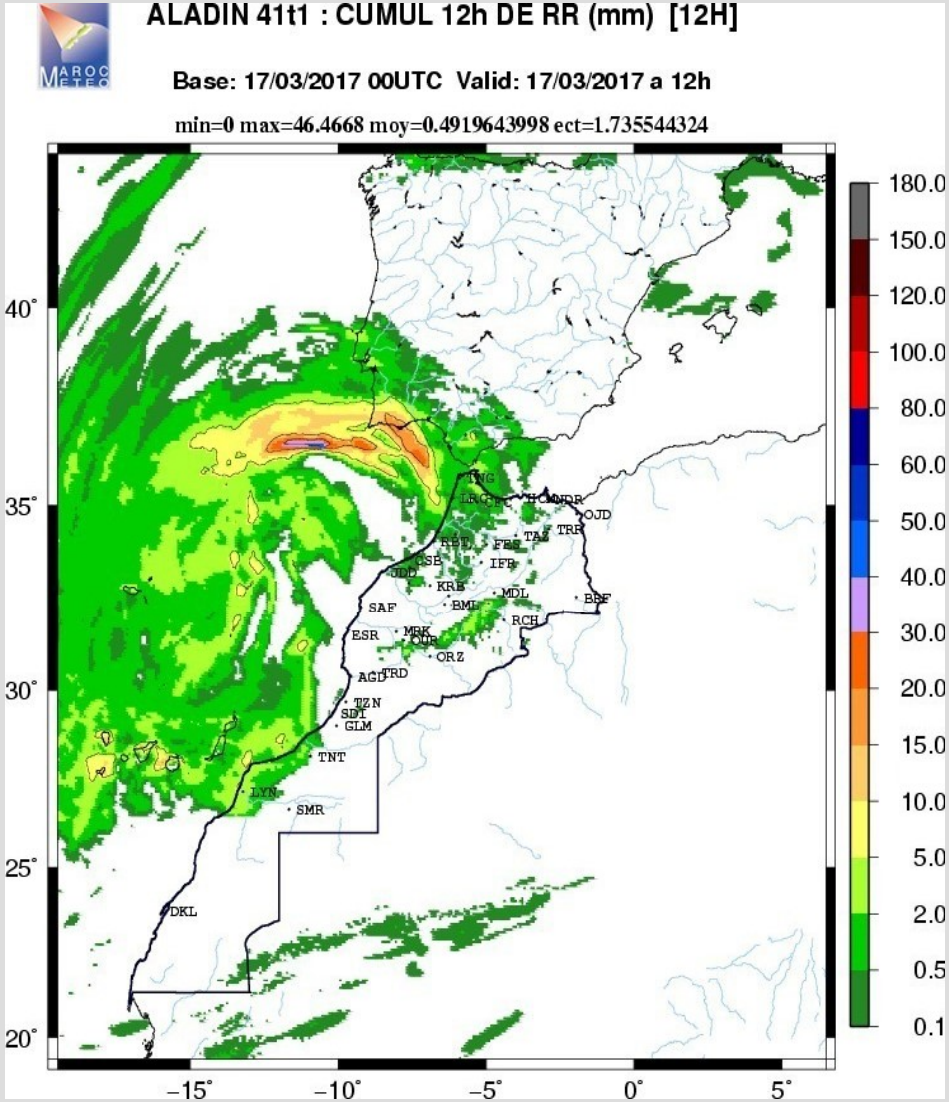
Overview on the data assimilation in Morocco : Description of ALADIN NORAF operational suite

- Cycle: cy41t1
- Resolution : 18km
- Vertical levels : 70
- Coupling : ARPEGE every 6hours
- Forecast range : 72 hours
- 2 runs per day (00 and 12UTC)
- Initial state : dynamical adaptation from ARPEGE analysis



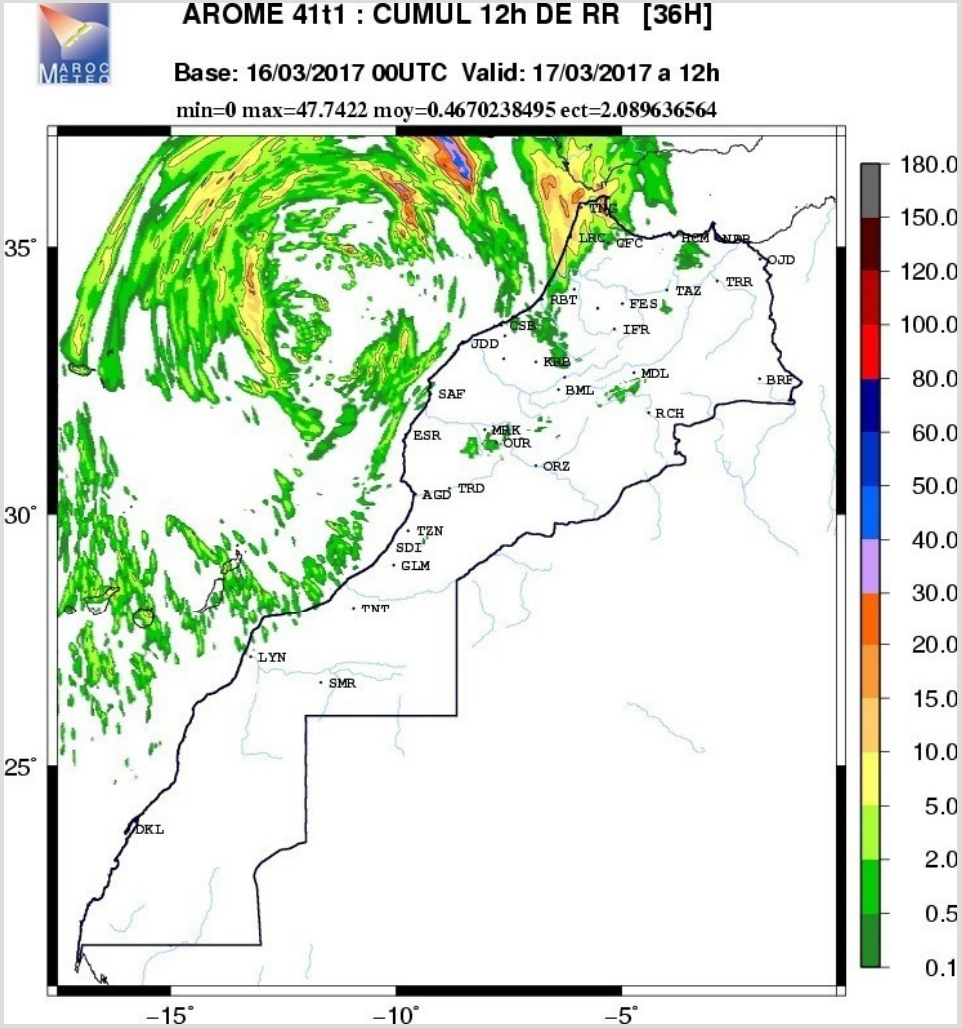
Overview on the data assimilation in Morocco : Description of ALADIN MAROC operational suite

- Cycle: cy38t1
- Resolution : 10km
- Vertical levels : 60
- Surfex
- Coupling : ARPEGE every 3hours
- Forecast range : 72 hours
- 2 runs per day (00 and 12 UTC)
- Initial state : dynamical adaptation from ARPEGE analysis



Overview on the data assimilation in Morocco : Description of AROME MAROC operational suite

- Cycle: cy41t1
- Resolution : 2.5km
- Vertical levels : 90
- Coupling : ALADIN MAROC every 1hour
- Forecast range : 48 hours
- 2 runs per day (00 and 12 UTC)
- Initial state : dynamical adaptation from ALADIN MAROC



Overview on the data assimilation in Morocco : History of data assimilation in Morocco

- ALADIN MAROC : CANARI since 1996 untill the crash of CRAY (2002)
- ALADIN NORAF: 3DVAR on IBM
  - Cycle 15 (2004)
  - Cycle 25 (2006)
  - Cycle 29 (2007)

  } Conventionnel observations only
- ALADIN MAROC :
  - Cycle 32 (2010) ← Assimilation of ATOVS radiances

  (ALADIN MAROC 16 km)
  - Cycle 36 (2012) ← Assimilation of MSG/SEVIRI

  (ALADIN MAROC 10 km)

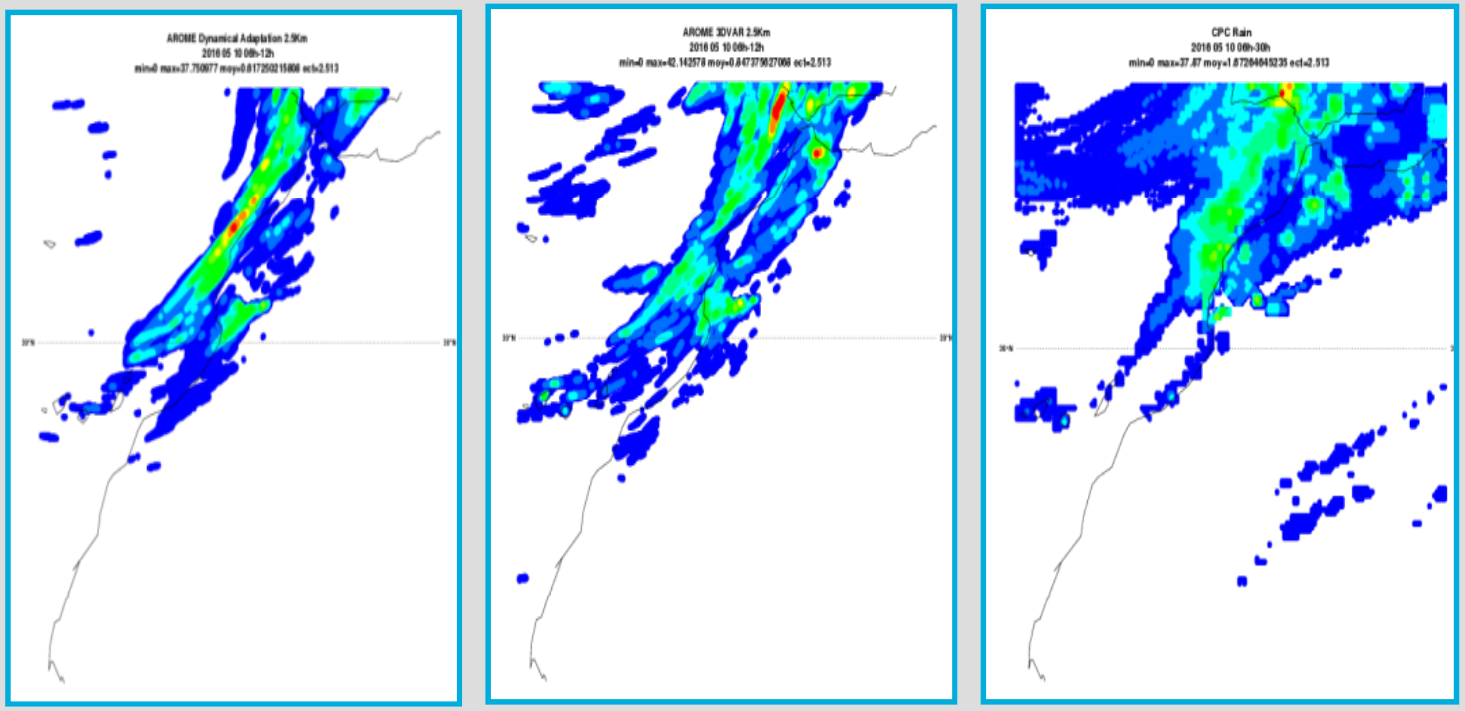
Overview on the data assimilation in Morocco : DA double suite in ALADIN MAROC

- 3DVAR for upper air analysis
- CANARI for surface analysis
- Ensemble B matrix
- Cycle 36t1
- Assimilation of conventional, SEVIRI and ATOVS data

Observation type	Assimilated variables
Synop	Z,T2m,U10m,Hu2m
Dribu	Z,U10m
Airep	T,U
Temp	T,U,Q
Satem	T_b

Overview on the data assimilation in Morocco : DA experiences in AROME

- 3DVAR for upper air analysis
- Ensemble B matrix
- Cycle 40
- Conventional observations



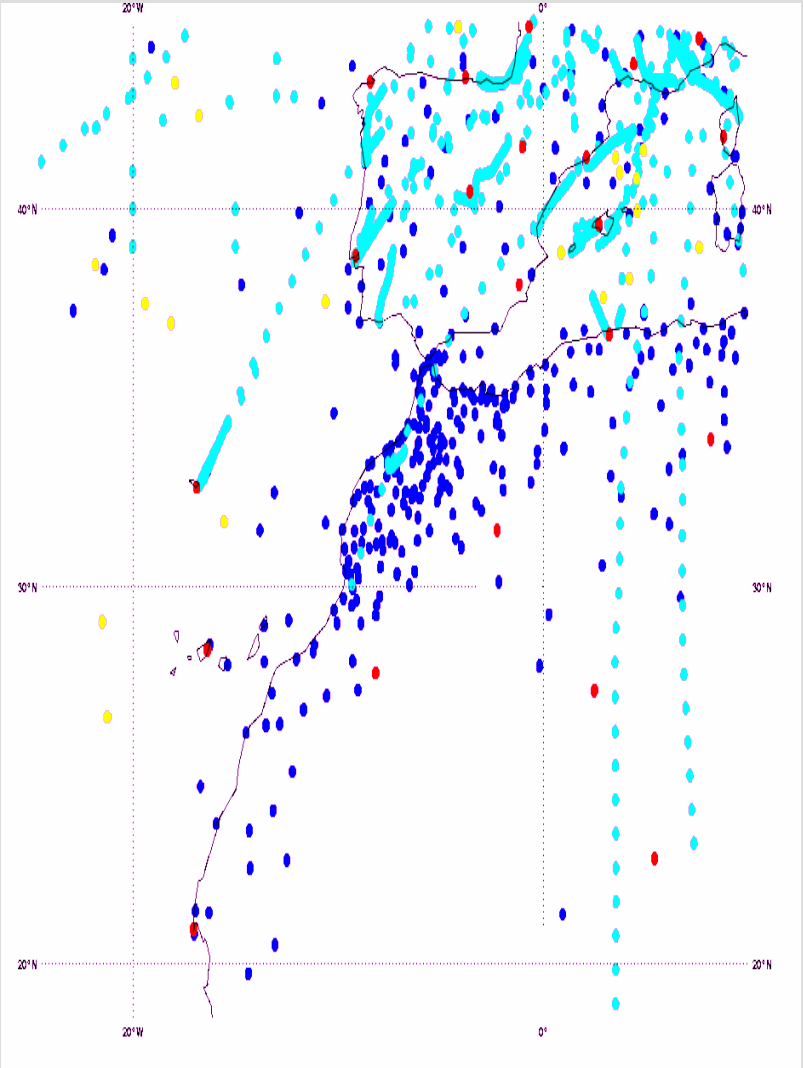
Main problems : DATA BASE

- Observations:
  - Synoptic land reports + VIGIOBS + AIREP + DRIBU
  - ATOVS
  - SEVIRI
- Local base based on:

  SYNERGIE data base programs

  + some local routines for extraction

  + Oulan
- 4 files per day with a 6hours observation window
- **BUT only** for conventional data



Main problems : Phasing cycle 40

Problem in routine: /arpifs/var/taskob.F90

With the option ORDERED in the MPI loop line 227, we have a crash in screening. Removing this option helped to escape this crash.

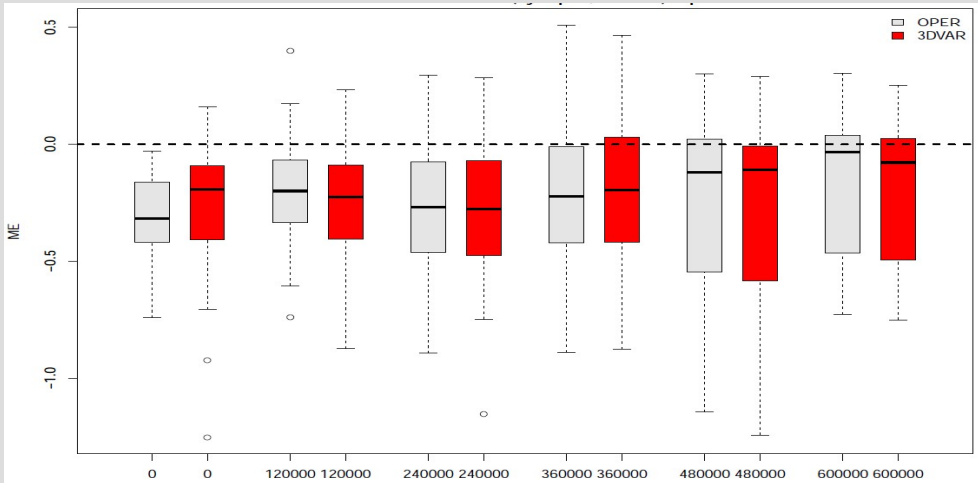
But randomly for some run there is problem in the screening.

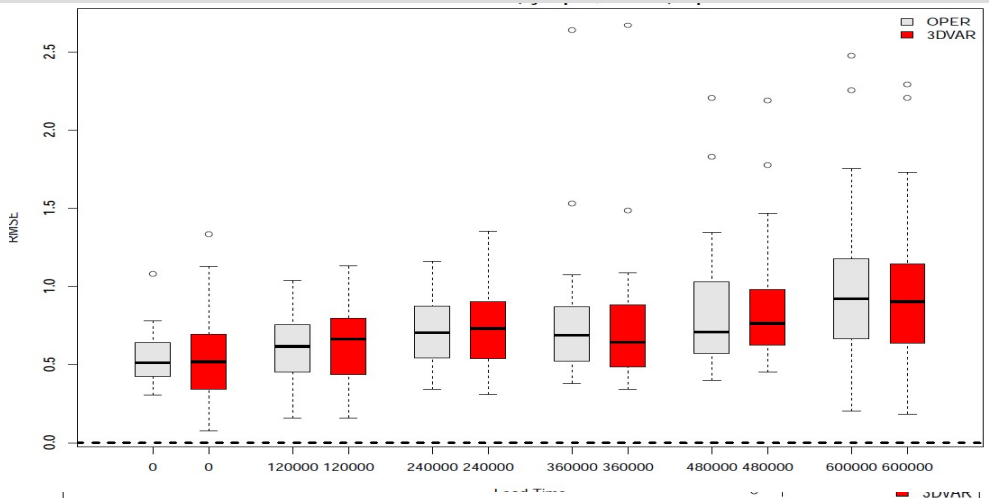
Main problems : Surface analysis in ALADIN MAROC 3DVAR suite

Problem with surface scores (T2m and HU 2m) versus operational suite

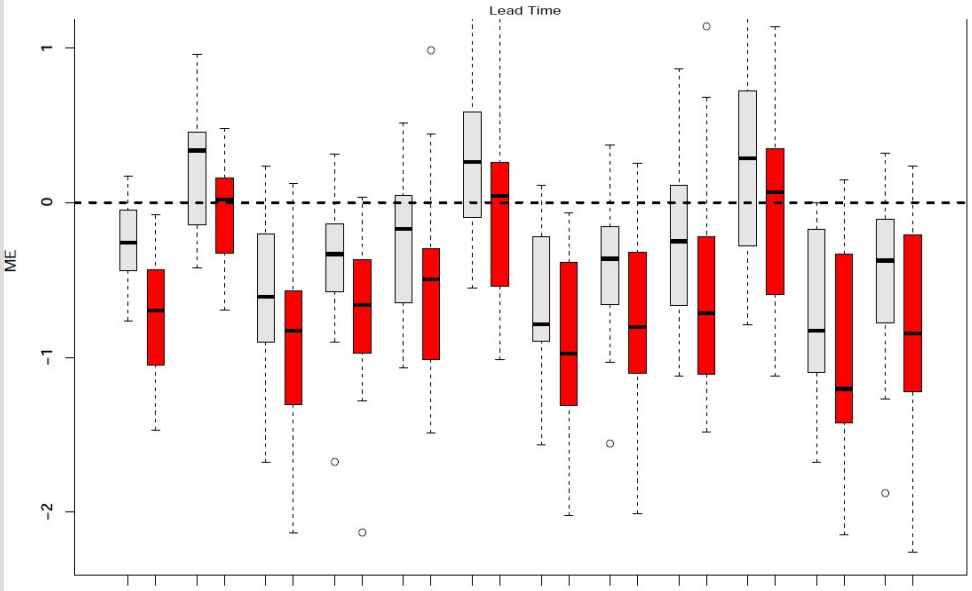
BIAS ***RMSE***

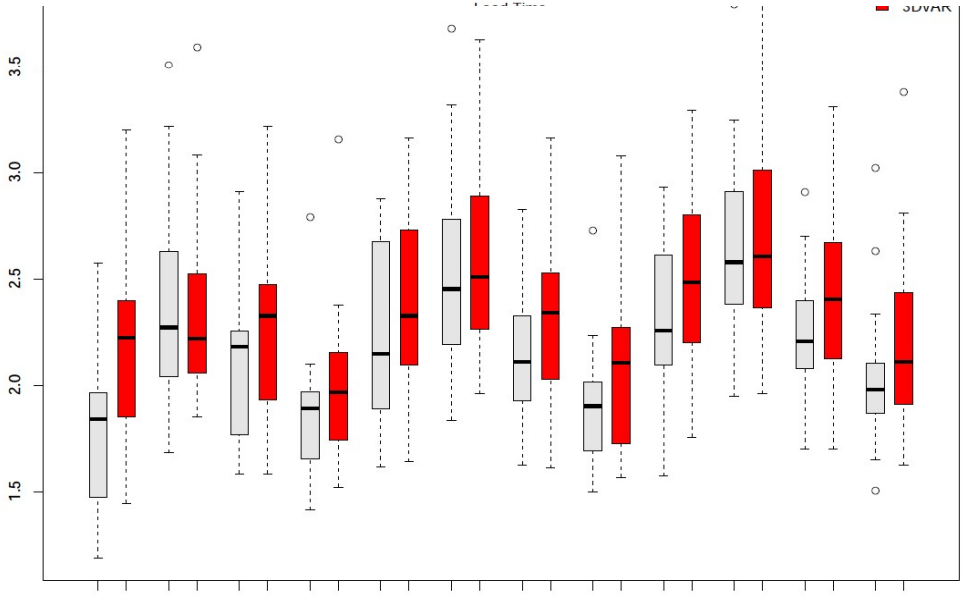
T 500





T2m





Plans for the future

- 3DVAR operational suite on AROME (2.5km and 90 levels)
- Phasing cy41 (Benchmark for the next calculator)
- B matrix (based on 3DVAR AROME ensemble)
- GPS (positive impact in ALADIN MAROC)
- More satellites data (AMV+IASI+SCAT…)
- Radar rainfall estimates

Thank you for your attention