

Computation of B-Matrix with ensemble DA for AROME Algeria in belenos

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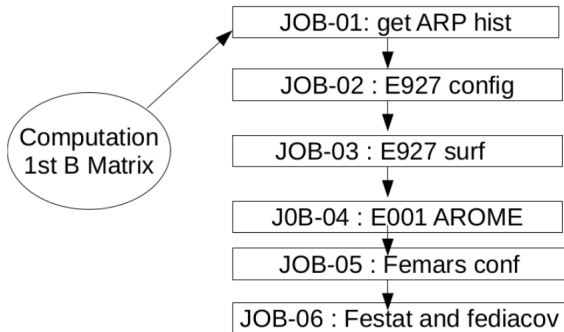
April 7, 2022

- 1 Computation of 1 st B-Matrix Ens-SU
- 2 Computation of second B-Matrix ens-Da
- 3 List of jobs for the B Matrix computation in belenos
- 4 Some diagnostics results

Computation of 1 st B-Matrix Ens-SU mode

As part of DAsKit activities with the collaboration of our colleagues (Maria,Idir, Yelis and Alex) I've worked with creation and adaptation of some scripts in Belenos for the computation of B-Matrix using ensemble DA method's.

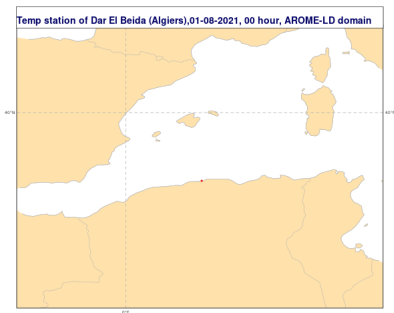
- I choosed AROME-LD Algeria configuration (3 Km, 90 Lev, 600*600, elon1= 353.96, elat1= 29.71, elon2 =14.23 , elat2 =45.43)
- We choosed two periods: 1st period "Cold period" : from 01-01-2021 to 15-01-2021 (r00), and the second period "warm period": from 01-08-2021 to 15-08-2021 (r12).
- We prepared LBC from ARPEGE ensemble DA members (mb001,mb002,mb003 mb004) (r00 r12)
- We've computed 120 ensemble differences (mb002-mb001,mb003-mb002,mb004-mb003,mb001-mb004)



Computation of second B-Matrix ens-Da

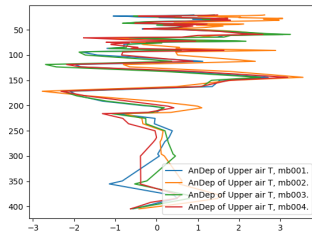
- Preparation of LBC from ARPEGE
- Perturbation of upper air observations (radiosondes and AMDAR):
In screening step namelist NAMSCC : LPERTURB=.T., NAESEMBER=MEMBno, MEMB=1,2,.. NAESEMBLE=1
[A. Bučánek, 23.9.2021, computation of B Matrix]
- Preparation of AROME-3DVar analysis for different members with 6h cycling
- Two periods of forecast, cold period: from 01-01-2022 to 15-01-2022, and warm period": from 01-08-2021 to 15-08-2021
- We've computed 120 ensemble differences during this period
(mb002-mb001,mb003-mb002,mb004-mb003,mb001-mb004)

Verification of perturbation of single radiosonde observation



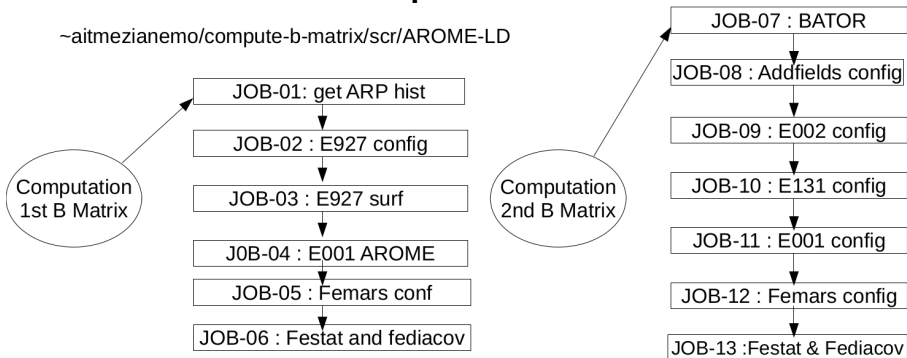
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ECMWF

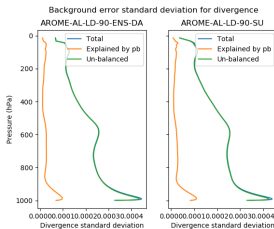
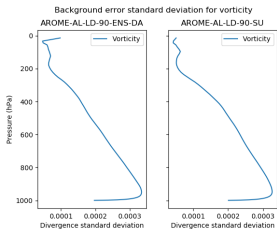
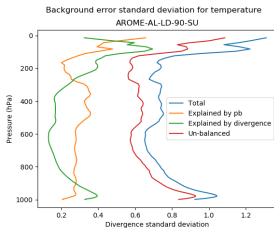
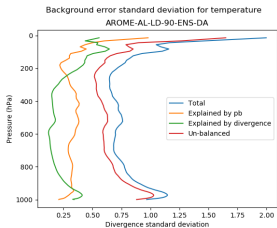


List of jobs on belenos for B matrix computation

~aitmezianemo/compute-b-matrix/scri/AROME-LD

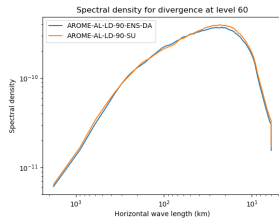
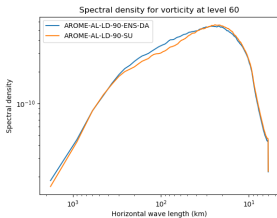
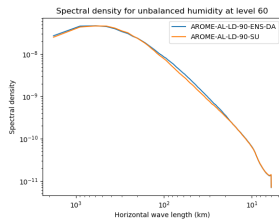
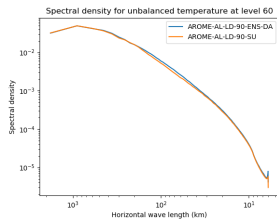


Some diagnostics results



- Background error standard dev for temperature, vorticity and divergence for Ens-DA B Matrix and Ens-SU B matrix.
- There is an impact for different parameters (more important in stratosphere)

Some diagnostics results



- Spectral density of temperature, humidity, vorticity and divergence at 60 level for Ens-DA B Matrix and Ens-SU B matrix.

Thank you for your attention !