

WG CONCLUSIONS: DATA ASSIMILATION

14th ALADIN Workshop
1-4 June, 2004
Innsbruck

DISCUSSED TOPICS

- J_b statistics
- Other algorithmic aspects
- Cycling
- Observation use

J_b statistics (1)

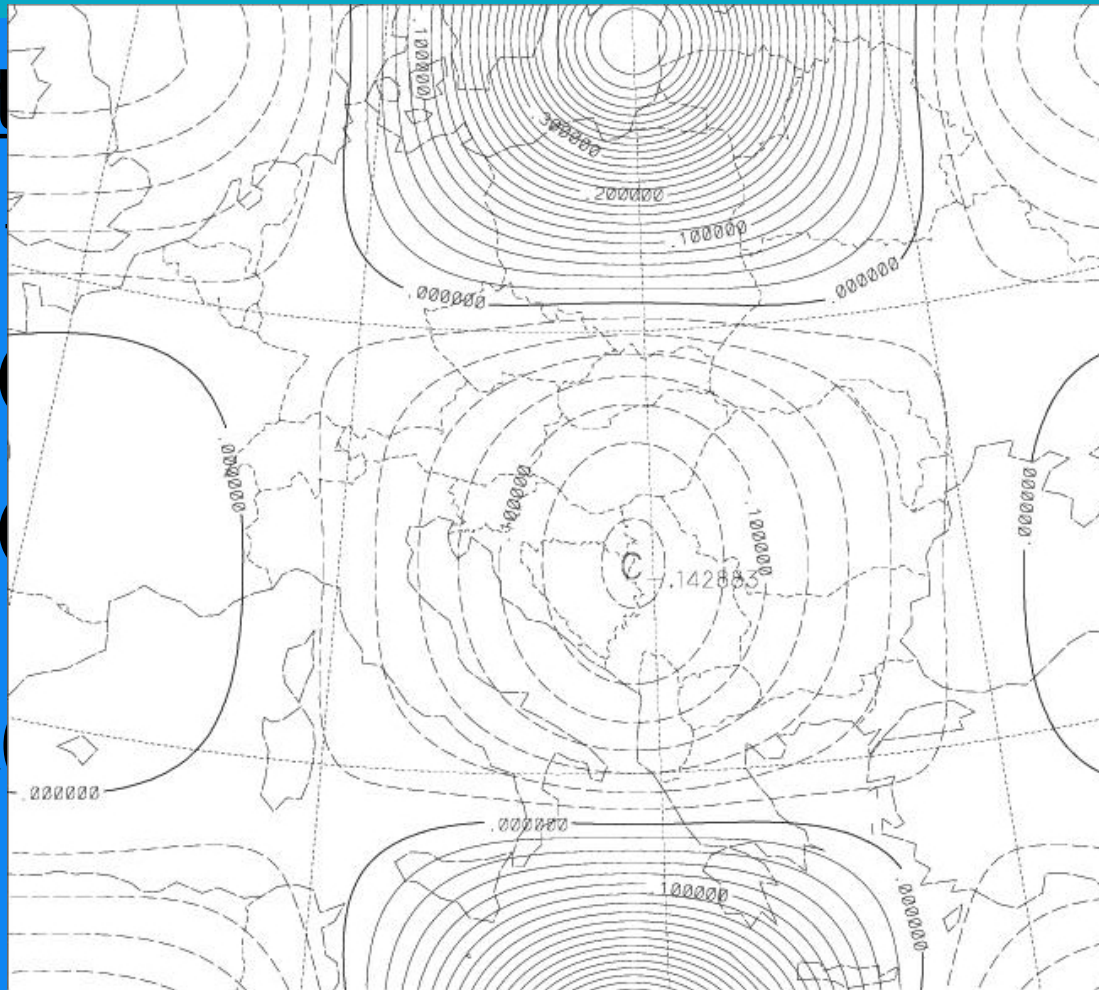
- Compact

$q(k^*)$

$q_{\cos u}$

$q_{\cos u}$

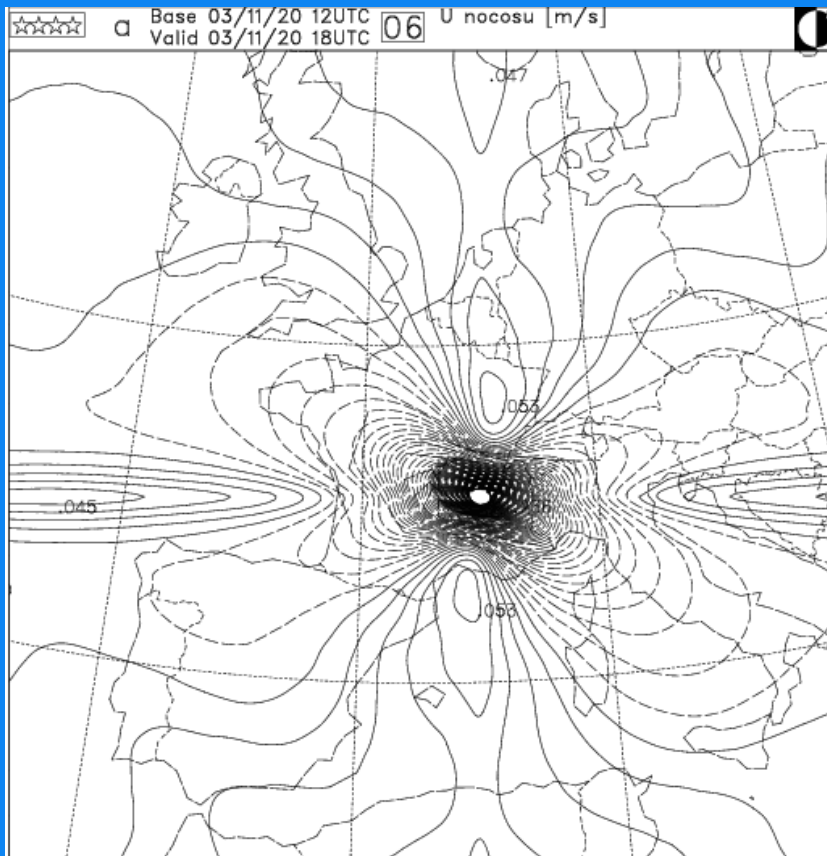
mask



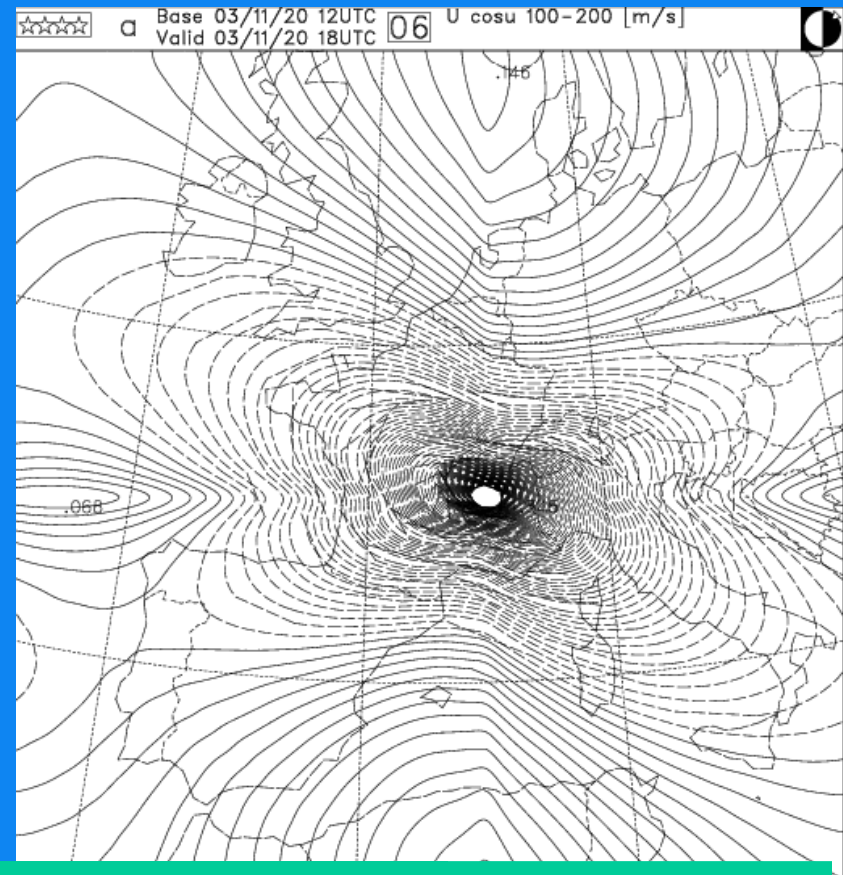
$+ dy^2$

J_b statistics (3)

no cosu



cosu



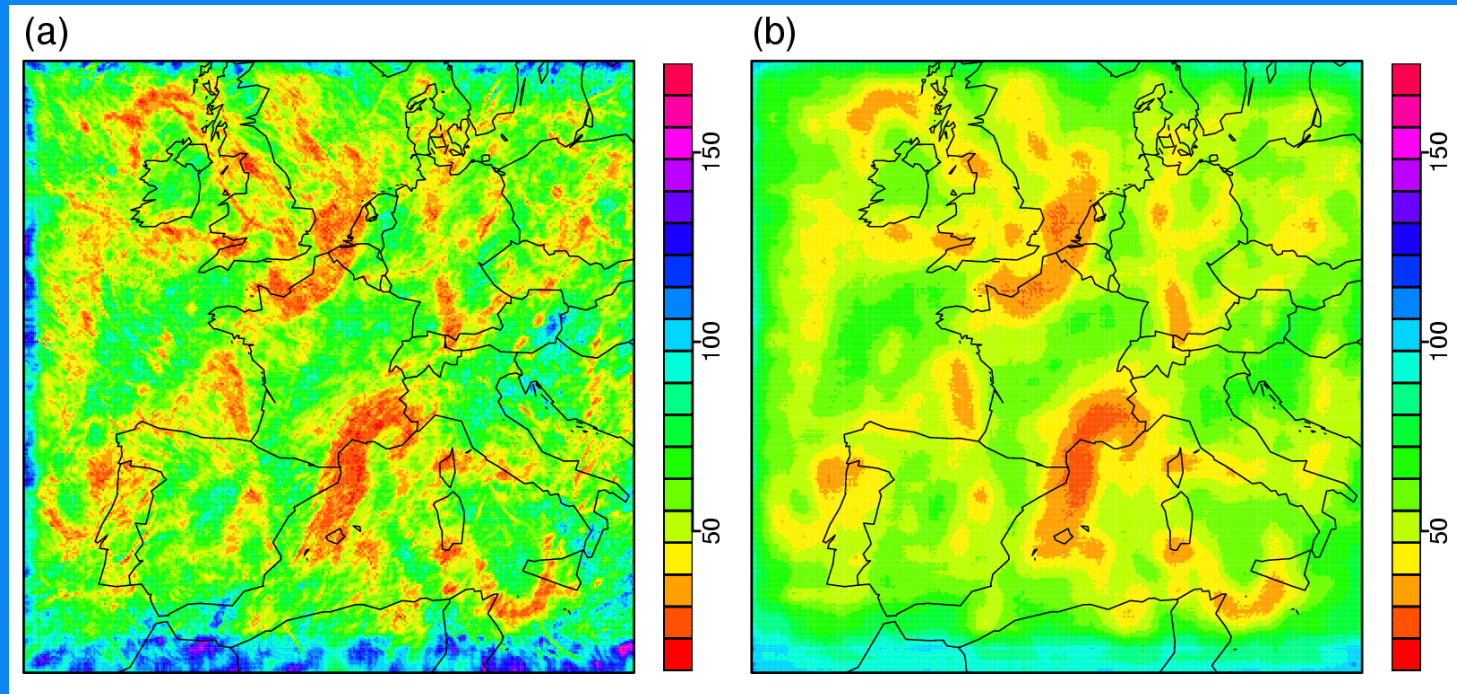
even (div,vor) \rightarrow (u,v) leads to problems

J_b statistics (4)

- enlargement of the E zone
 - efficient solution (at least in 1D tests of Vincent Guidard)
 - maybe too expensive in CPU if the model is very HR (11 → 41 points)
- non diagonal (full) B matrix
 - geographical variation of correlation lengths
 - expensive minimization & B matrix computation

Jb statistics (5)

- wavelet representation (scale & position)
 - possibility to introduce geographical variations of the correlation functions



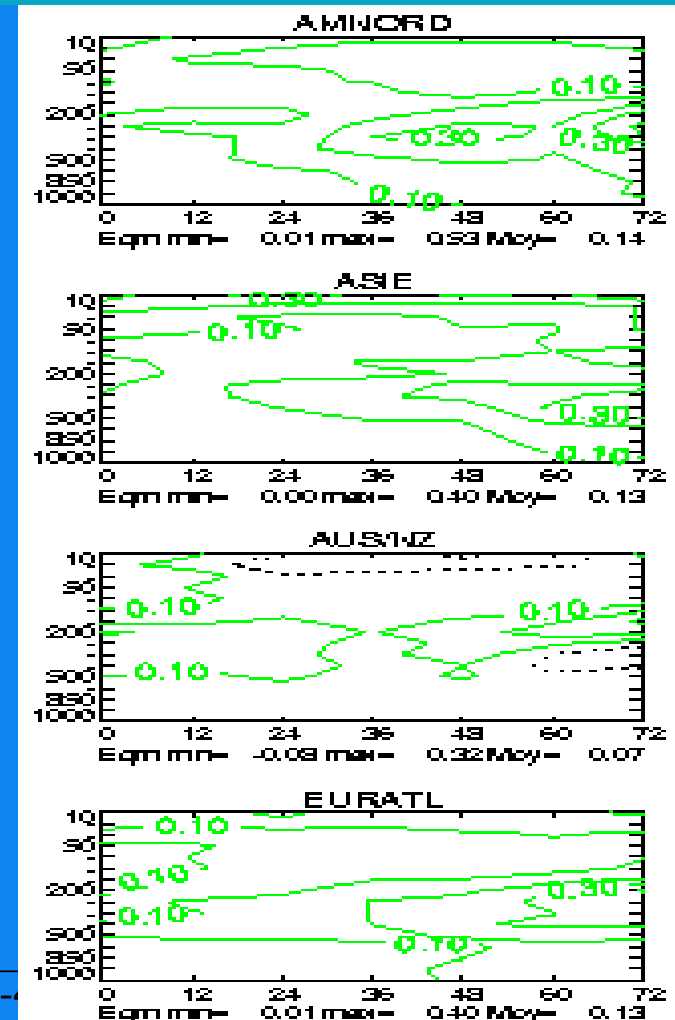
Jb statistics (6)

NMC - ENS

- ensemble versus NMC method

→ better estimation of the background errors

→ possibility to estimate analysis errors (Jk term, separation of Aladin forecast errors and Arpege analysis errors)

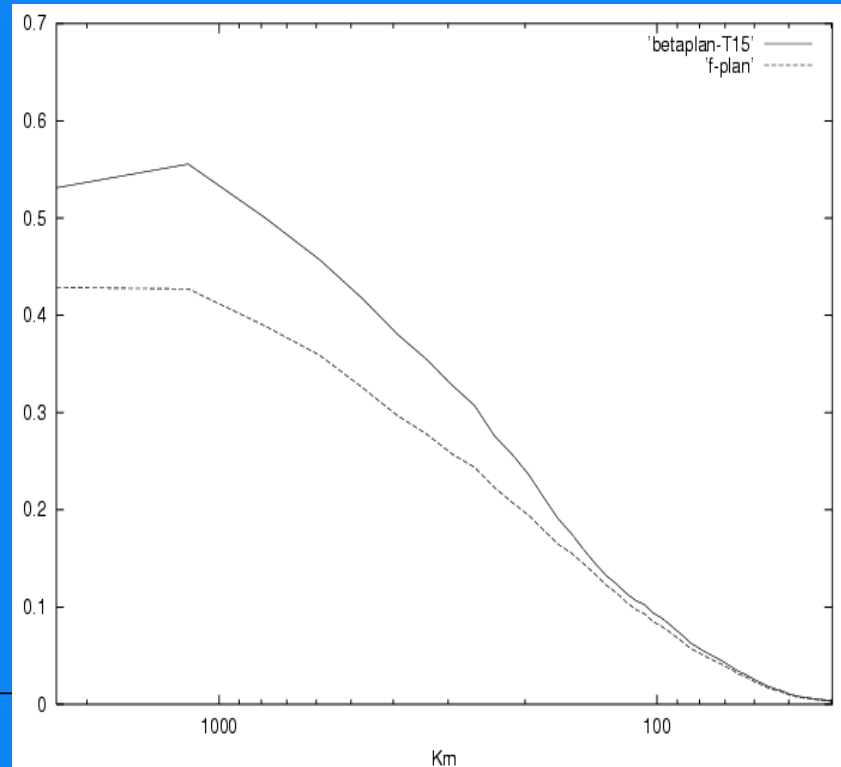
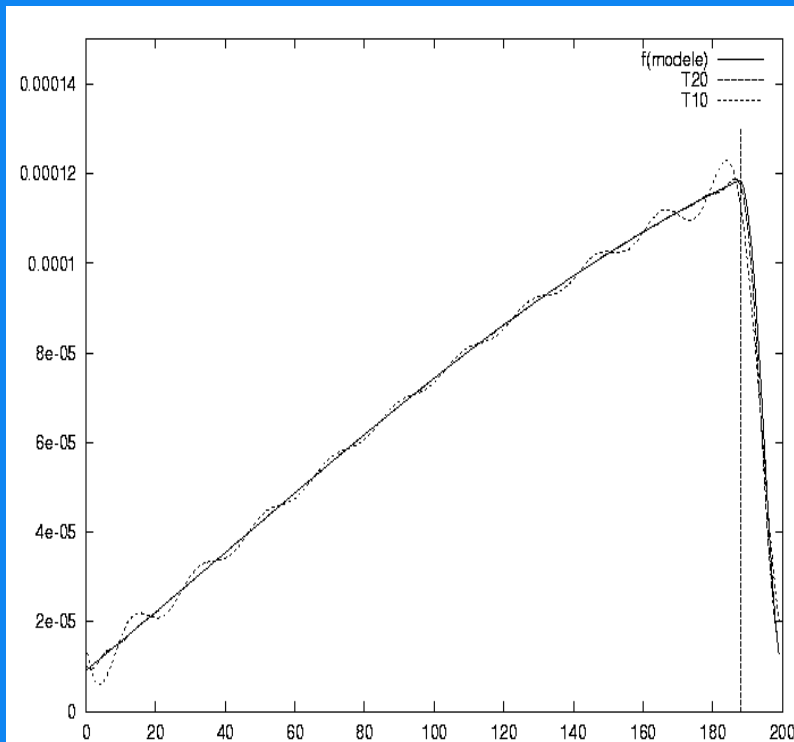


Jb statistics (7)

- β -plane f

→ Meridional variation of the Coriolis parameter

$$\nabla^2 \Phi = f \zeta$$

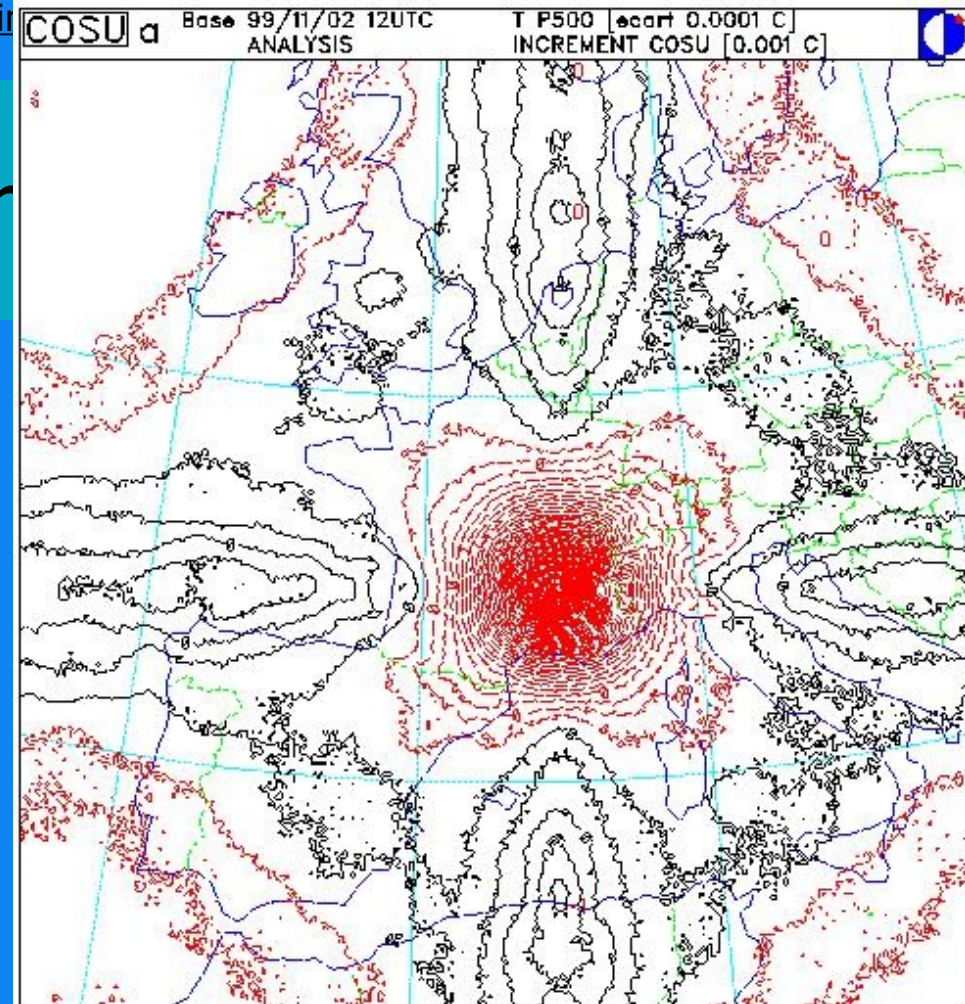


Other algorithms

- 3dvar tests with rectangular truncation

→ motivation: better representation of isotropy
(bijective Fourier transform)

→ No enthusiastic results so far (?)



→ But maybe a technical step towards Arôme assimilation!

Other algorithmic aspects (2)

- 3d-fgat in Aladin (fgat: first guess at appropriate time)
 - the work has just started
 - better treatment of high frequency observations
- Latent heat nudging (slovenian colleagues)
 - It is going on (results expected later)

Cycling: Aladin/Fr 3dvar tests

- 30 day assimilation cycle (03/06/2003-02/07/2003)
- initial setup
 - 3dvar analysis 6 hourly
 - Lagged NMC B matrix ; REDNMC=1.3
 - “traditional” LBC: 3h frequency, time consistent
 - No DFI, No blending
 - Surface analysis: Arpege OI
 - Same observations as in Arpege

Cycling: Aladin/Fr 3dvar tests

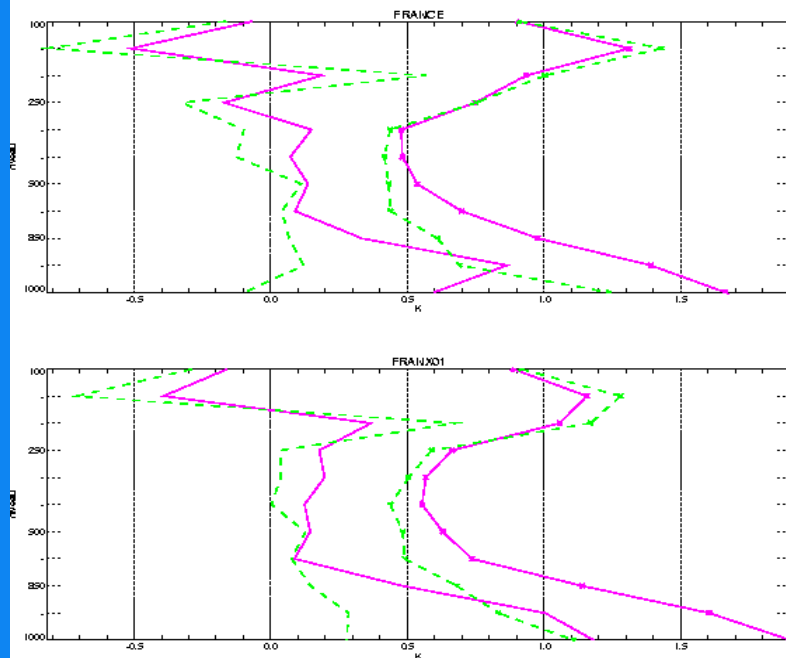
TEMPERATURE 3D-VAR Cycling Experiment

ECH. : / 0 /

29 cas, 03/06/2003_12UTC -> 01/07/2003_12UTC

— Biais PLAD1.r12/TP - - - Biais PAAA0.r12/TP
* - * Eqm PLAD1.r12/TP * - - * Eqm PAAA0.r12/TP

ECH.0



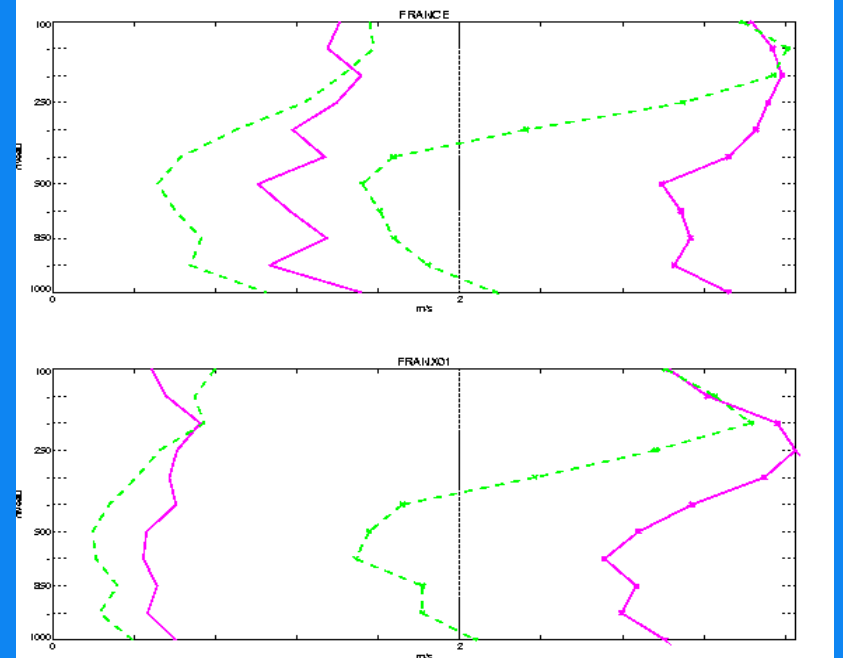
VENT 3D-VAR Cycling Experiment

ECH. : / 0 /

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* - * Eqm PLAD1.r12/TP * - - * Eqm PAAA0.r12/TP

ECH.0



Aladin/Fr 3dvar tests (3)

- more testings
 - Moroccan (Arpanal) coupling strategy
 - “Inertial” cycle (without 3dvar analysis)
 - BlendVar
 - 2 periods (summer & winter)
 - case studies

Observation use (1)

- Satellite observations

→ ATOVS/AMSU-A data has entered the Aladin/hu 3dvar parallel suite (Roger's presentation)

→ MSG clear-sky radiances (Fr)

→ Humidity bogoussing (Fr)

→ ATOVS/AMSU-B will start soon at HMS

→ MSG SATOB wind at HMS (end of 2004)

Observation use (2)

- Aircraft observations
 - AMDAR data at HMS (Roger)
- Windprofiler (HMS)
 - study data quality and amount
 - feeding ODB

Observation use (3)

- Radar developments

1. Assimilation (use the data in the model)

Indirect way:

→ 1dvar retrieval of q, T profiles

→ assimilation as pseudo temp or satem

2. Monitoring (verification and obs error estimation)

Direct way:

→ obs operator but no TL/AD

→ reshape the MesoNH "radar simulator"

Observation use (4)

- observation data flow for radar data is prepared (setup of obs, ODB, screening)
- obs minus guess could be computed (observation operator?)

THANK YOU FOR YOUR ATTENTION