Atmos. Meas. Tech. Discuss., 6, C1137–C1139, 2013
www.atmos-meas-tech-discuss.net/6/C1137/2013/
© Author(s) 2013. This work is distributed under
the Creative Commons Attribute 3.0 License.

Atmospheric Measurement Techniques Discussions

Interactive comment on "Implementation of a 3-D-Var system for atmospheric profiling data assimilation into the RAMS model: initial results" *by* S. Federico

Anonymous Referee #2

Received and published: 30 May 2013

The paper presents a rather standard 3D-VAR implementation as developed and well documented by the referred authors about 15 years ago. There is nothing new in the data assimilation development, but a documentation of still significant work to implement a basic variational analysis for RAMS. It is not clear to me what DA RAMS had before, but I assume and from what I can find, that it had no standard 3D-VAR on its model grid at all (in stead a lot of ad hoc methods like nudging and dynamical adaptation). Under this assumption, the authot has made significant progress and the paper serves as a documentation to go with the RAMS system.

The results are far to basic to be of scientific interest today, and the experimentation

results are extremely basic. It shows nothing of relevance to meso-scale modelling and only that a bacis DA gives better fit to observations than no DA.

There are also a few misunderstandings and one mistake I believe, in the implementation of the transform (full T or un-balanced T).

See below:

2013-05-22 - 29

Review AMTD

P 2 r 10: law -> laws

toward - > towards analyses -> analysis

Frequently mixed up singular and plural !

3587 9 : innovations : are observation increments, you probably mean analysis increments here : specify

3588 : correlation between u-v must be respected see e.g. Daley, Hollingsworht, Undén....

3589 15 : T should here be the unbalanced T, since there is a large balanced component related to the geopotential Z. I believe this is a serious omission. It will work anyway but it is not correct.

3590 the background error should not need to be specified as simply as that: It can be derived from the NMC method.

3592 QC check is very ad-hoc and no science behind it (no flow dependency, level, latitude etc., no cross check)

3606 Fig. 4 b. Very strange increments. Looks like only 3 observations used. Not credible.

3608-10 Fig. 6 - 8. None of the figures are legible. I cannot see any numbers, the font size is 5 times smaller than the text! If published need to be remade.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 3581, 2013.