

Dear Editor,

Thank you very much for all your comments and corrections that have improved the quality of the article. Please find below the modifications done in the last version of the manuscript and a marked-up manuscript version.

Your faithfully,

Dr Nadia Fourrié

*P. 3, ll. 8/9: can you explain "dense water formation". The reader unfamiliar with this expression has to wait until Page 18 where (s)he learns that it has to do with the salinity of sea water. This explanation should be given already here.*

The explanation is now given here and it has been suppressed in page 18.

*P. 3, ll. 18-21: fix order of brackets.*

Done

*P. 4, ll. 7-10: Probably this is something you forgot to delete when inserting new text.*

This sentence “experiments using initial condition from ALADIN-France (Aire Limitée Adaption Dynamique et développement InterNational) and this model was run during 6 months (June--November 2007).” has been removed.

*P. 4, l. 12: either delete "the" or explain which hydrological and ocean models you refer to. "The" deleted.*

*P. 6, l. 26: either write 1h30m or 1.5h.*

1h30m has been written.

*P. 7/8, last and first line: it is not clear what the sentence in brackets means. What refers to first and second week.*

The sentence in brackets has been reworded : (warm and anticyclonic conditions during the first week (25 April to 2 May 2010) and cold and perturbed conditions during the second one (3 to 10 May 2010), giving a good meteorological sample).

*P. 10, ll. 5-10: The statement that some balloon measurements were discarded appears twice. Also "sampling pace" should be replaced by "sampling rate".*

This sentence line 5 “As some balloons ascended rapidly when encountering strong up-drafts which were generated by deep convection, their data were discarded.” has been removed and pace replaced by rate.

*P. 10, l. 23: the expression "horizontal thinning" is a bit ugly. Perhaps "horizontal sampling" would be a good alternative. The same in line 25.*

Done.

*P. 12, l. 5: What do you mean with "intermediate cloudiness"? Are these clouds in the mid troposphere or clouds with about 50% coverage?*

Intermediate cloudiness corresponds to partial cloud cover. The sentence has been modified as follow: “The main changes in the AROME model reside in the revision of the cloud scheme with a realistic increase of clouds with partial cloud cover, in addition to changes concerning observation use.”

*P. 12, l. 20: "update procedure".*

Correction made.

*P. 12, l. 22: please note that the plural of aircraft is aircraft, without an "s" at the end.*

Done.

*Figure 6: is sufficiently large now, but in the caption it should be top and bottom, not left and right.*

Corrected.

*P. 15. last line: Still I do not understand what you mean here. I believe you want to say that half of the stations had at least one missing data, but what is the 7%? Is it the total fraction of missing data?*

7% is the fraction of stations having only one missing data. We propose to change the sentence in “Half of the stations had at least one missing data and 7 % of the whole dataset only had one missing data.”

*P. 16, l. 13: delete one instance of "5%".*

Done

*Figure 12, caption, last line: "There is no difference" or "there are no differences". One full stop at the end suffices.*

The sentence has been changed with “In this case, there is no significant difference.”

*Figure 14, caption: Please rewrite the last sentence. For instance: Stars represent the statistical significance of the difference between the two models, which is 90% for all forecast ranges above 12 hours.*

Your proposition has been inserted in the caption of Figure 14.

*P. 19, l. 22: "margin error" -> "error margin".*

Done

*P. 19, l. 24: Cut-and-Paste error.*

Corrected

*P. 19, ll. 24/25: "The difference ... are ... drawn from" is grammatically and factually incorrect (differences are not drawn).*

The following modification is proposed :”The difference between both model biases is similar to the one found during SOP1.”

*P. 20, ll. 1-3: This sentence needs to be reworked as well.*

The sentence has been reworded : “These covariances favour the performance of AROME-WMED during SOP1 (period affected by convective precipitation), but during SOP2, this

background error is less well suited (than the AROME-France one) to the forecast of rainy events driven by the large scales.”

*Figure 18, caption: Please rewrite the last sentence. For instance: Stars indicate where the statistical significance of the difference between the two models exceeds 90%.*

The last sentence of Fig 15,18 and 19 captions has been replaced by your suggestion.

*Eq. A4: Please check whether there is a difference between  $DD$  and  $dd$ . If not, make consistent.*

Done