

Nonlin. Processes Geophys. Discuss., referee comment RC1
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Comment on npg-2021-15

Anonymous Referee #1

Referee comment on "Reduced non-Gaussianity by 30s rapid update in convective-scale numerical weather prediction" by Juan Ruiz et al., Nonlin. Processes Geophys. Discuss., <https://doi.org/10.5194/npg-2021-15-RC1>, 2021

Review of "Reduced non-Gaussianity by 30-second rapid update in convective-scale numerical weather prediction " by J. Ruiz et al..

General comments: The manuscript investigated the degree of non-Gaussianity of forecast error distributions and how it is affected by the DA update frequency and observation number. This article used 1000 ensembles, but the generation of ensembles is not very clear. The introduction of the KLD method is not clear. Some words are not rigorous. This paper theoretically provides evidence that increasing the update frequency and the observations can improve the accuracy of assimilation in convective-scale. I think this manuscript can be considered for publication if these concerns could be addressed:

Specific comments:

- The generation of ensembles need to be described in detail, because it is very important for this article and the ensemble DA method.
- The introduction of KLD should contain how to operate in this article? What should be noted? So that readers can repeat your experiment

- Is the solution of KLD grid point by grid ? Using the assimilated ensembles to statistics?
- Please give the formula of relative KLD difference.
- Please explain "closest" quantitatively.
- The higher the update frequency, will it break the balance between physical variables?
How to understand and explain.
- This paper used the super-observations. What is the relationship between observation scale and grid scale matching and more observations?
- This article needs polishing.