Reply on RC1

Chu-Chun Chang and Eugenia Kalnay

Author comment on "Applying prior correlations for ensemble-based spatial localization"
by Chu-Chun Chang and Eugenia Kalnay, Nonlin. Processes Geophys. Discuss.,
https://doi.org/10.5194/npg-2022-5-AC2, 2022

We sincerely thank the reviewer for the questions that help us to improve the clarity of our manuscripts. The reviewer posted comments related to the feasibility and the foundation of our method. A major concern from the reviewer is the extensive use of YK18 from the L96 model to sophisticated models, which is an important topic that deserves further discussion. We would like to note that it is common to use the L96 model as a first step to examine the feasibility of new approaches, such as another amazing localization work done by Anderson (2007). The applications to large models, including the multivariate effects and practical strategies, will be explored in our future studies.

In this revised manuscript, we have incorporated the reviewer's comments and updated our experiments with an offline run that has the same ensemble size as the experiment. The new results proved that the YK18 can be derived from past data or offline runs with limited ensembles, by which the reviewer's main concerns are likely to be resolved.

Please find the detailed response to each question in the supplement.

If our answer and interpretation are not clear enough to the reviewer, we are pleased to have a meeting with the reviewer to discuss it in more detail.

Please also note the supplement to this comment:
https://npg.copernicus.org/preprints/npg-2022-5/npg-2022-5-AC2-supplement.pdf