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Comment on npg-2022-5

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.,
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Dear editors and reviewers,

Thank you for all the comments on our manuscript entitled "Applying prior correlations for ensemble-based spatial localization". We greatly appreciate the interests that the editors and the reviewers have taken in our manuscript and the constructive comments they have given.

All the comments and suggestions were very helpful for revising and improving our paper. There are many comments related to the applicability of our method in real applications, which are important and deserve further discussion. We have studied these comments carefully and have made corresponding corrections that we hope will meet with your approval. More specifically, we have made the following significant changes in this revision:

- 1) All the results have been updated with a more practical and convincing configuration. We have re-conducted the YK18 and related methods with offline runs that have the same ensemble size as the DA experiments.
- 2) We have greatly improved the clarity and the flow of our manuscript, including adding more references, more explicit interpretations of the results and settings, and corrections on some minor writing errors.
- 3) Discussions related to the real applications of our method (i.e., location varying observations, implementing a large model) have been added to the manuscript.

A point-by-point response to the reviewers' comments is included in the Referee Comments (RCs) (the reviewer's comments are in italics). Changes in the revised manuscript are tracked and highlighted in blue color.

Thank you again for your consideration of our revised manuscript. If you have further queries, please do not hesitate to contact us.

Sincerely,
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