

Interactive comment on “Revising the stochastic iterative ensemble smoother” by Patrick N. Raanes et al.

Anonymous Referee #2

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This manuscript reformulates the algorithm of the original ensemble randomized maximum likelihood (EnRML), a stochastic EnKS, and compares its performance with other iterative schemes using the Lorenz-96 model. The manuscript is well written. I basically have no critical comment on the proposed method. However, I would like to recommend the authors performing some additional Lorenz-96 experiments to discuss differences between EnRML and iterative EnKS. For example, the following experiments would be interesting:

- (1) experiments with imperfect observation error variance
- (2) experiments with higher nonlinearly (e.g., larger obs error or infrequent assimilation)

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(3) experiments with model imperfection

Those additional experiments, I believe, should improve the manuscript more.

[Minor comments]

1. Please add dimensions of matrices as Eqs. (13) and (14) so that we can follow equations easier.
2. I recommend the authors to add a schematic figure that simply illustrates the proposed method compared with the original EnRML and iterative EnKS.
3. “stochastic and deterministic ES-MDA” should be explained more.

Interactive comment on Nonlin. Processes Geophys. Discuss., <https://doi.org/10.5194/npg-2019-10>, 2019.

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