

Dear Jana, Sangeetika and Svetlana,

Two referees have submitted their reports on the revised version of your paper. They are the same referees as for the previous version. Referee 1 (Femke Vossepoel) recommends acceptance of the paper as it is. Referee 2 (Marc Bocquet) also recommends acceptance, subject to a few modifications, in particular on the use you make of the expression *Ensemble Kalman filter (EnKF)*.

I myself as Editor make below a number of suggestions for modifications, including one on the expression *Ensemble Kalman filter* (but not the same one as Marc Bocquet).

Please consider all these suggestions, and modify your paper accordingly if you agree with them (give an answer only if you disagree).

Feel free to get in touch with M. Bocquet or myself if you wish.

I thank you for having submitted your paper to *NPG*, and look forward to receiving the final version.

Olivier Talagrand
Editor, *NPG*

My Editor's suggestions (*line numbers are those of the version of the paper without explicit identification of the corrections from the previous version*)

Ll. 26-27, *Markov chain Monte Carlo (MCMC) methods* ... Give references.

L. 40, *Ensemble Kalman filtering (EnKF) approximates only the first two moments of the posterior*, ... EnKF produces an ensemble, from which estimates of higher order moments, such as skewness and kurtosis, can be obtained (although possibly with poor accuracy). I would suggest ... *approximates primarily the first two moments* ... (see also l. 223).

L. 43. You might add *Le Gland et al. (2011)* in the list of references you give there.

Ll. 49-50, *In the numerical weather prediction community, it falls under a large umbrella of Ensemble of Data Assimilation*, ... In the numerical weather prediction community, the expression *Ensemble of Data Assimilation* does not refer to Ensemble Kalman Filter. It refers to an ensemble of variational assimilations, performed on independently perturbed data. Now you may wish to refer to all assimilation methods, whether of the EnKF type or not, which produce an ensemble of point estimates meant to sample the posterior probability distribution. If so, be more explicit. And see also the related comment by M. Bocquet.

L. 52, *In order to sample highly-correlated samples*, ... What do you mean by *highly-correlated samples* ?

L. 106, Do you mean *When an easy-to-sample **ensemble** from the prior μ_0 does not...*

L. 108, Do you mean ... *or **lack** of accuracy of the observations* ?

L. 120, ... *to find ϕ_t* (index)

L. 165, *A century later*, ... Actually, it was more than a century later. I suggest *A century and a half later*, ...

L. 171, Eq. (9), no meaning is given at this stage to u and $u\sim$

L. 207, ... *that is constrained* by ...

L. 216, $C(\alpha)$ does not seem to have been defined

L. 340, *The x-axis* ... \rightarrow *The horizontal axis* ...

Same remark for captions of Figures 2, 4 and 7 (and maybe elsewhere). Do not mention an *x-axis* when there is no *x*.

L. 70, ... *by* *Avecedo et al.*

L. 80, ... *while another one leads* to ...

L. 197, ... *Algorithm 2*, I presume

REFERENCE

Le Gland, F., Monbet, V., and Tran, V.-D.: Large sample asymptotics for the ensemble Kalman Filter, *The Oxford handbook of nonlinear filtering*, Oxford University Press, 598–631, 2011.