Two referees have sent their evaluations. They are the same as the referees of the previous version (referee 1 is I. Grooms, and referee 2, who does not want to remain anonymous any more, is Lili Lei, from Nanjing University).

Both of them consider the author has satisfactorily responded to their concerns, and recommend acceptance of the paper. Referee 1 just mentions that there are typos to be corrected (the paper will in any case go through copy-editing).

I follow the referees' recommendation, and accept the paper. I however as editor still have a few suggestions for modifications.

1. L. 268. It would be preferable to give a scale of comparison for the variances of the observation errors. My colleague Mohamed Jardak and myself (Jardak and Talagrand, 2018) found a 'climatological' variance of 10^3 for the Lorenz 96 model, to be compared with the value 1 used here by the author for the IDEN observations (but the numerical conditions of the experiments may not be the same).

2. L. 217. *Figure 5 indicates that the virtual members have better ensemble statistics than the forecast ensemble.* What do you mean by *better* ? The CDFs shown in Fig. 5 from the virtual members are smoother than the CDFs obtained from the forecast members. Is that what you mean, or what ?

3. Ll. 73-74. I suggest to state more precisely what the notation Chol(C) exactly means. I understand it denotes the lower triangular matrix of the Cholesky decomposition $C = U\ U^{\mathrm{T}}$ of the matrix C, but is it U or U^{T} that is lower triangular (that may be irrelevant, but may nevertheless matter for a reader who wants to implement the algorithm) ?

REFERENCE

Jardak, M., and O. Talagrand, Ensemble variational assimilation as a probabilistic estimator – Part 1: The linear and weak non-linear case, 2018, *Nonlin. Processes Geophys.*, **25**, 565-587, https://doi.org/10.5194/npg-25-565-2018.