



Interactive comment on “A local particle filter for high dimensional geophysical systems” by S. G. Penny and T. Miyoshi

Anonymous Referee #1

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Authors propose a local particle filter (LPF) that outperforms traditional ensemble Kalman filters in highly nonlinear/non-Gaussian scenarios, both in accuracy and computational cost. The standard Sampling Importance Resampling (SIR) particle filter is augmented with an observation-space localization approach, for which an independent analysis is computed locally at each grid point. The deterministic re-sampling approach of Kitagawa is adapted for application locally and combined with interpolation of the analysis weights to smooth the transition between neighboring points.

The approach is validated using the 40-variable Lorenz-96 model.

An inflation mechanism used here was effective for the Lorenz-96 system, but it is not adequate for more realistic atmospheric or oceanic models.

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This is an innovative work with high potential

My main concerns are that work of Chorin and Mortzfeld on implicit PF is not mentioned along with a unique comparison of EnKF, MLEF and PF for nonlinear and non-Gaussian cases (Jardak et al. 2010).

Reference to work of Xiong et al. (2006) should also be made.

Overall a promising approach recommended for publication with minor revisions

References

Xiong, X.; Navon, I. M.; Uzunoglu, B.

A note on the particle filter with posterior Gaussian resampling

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