

Interactive comment on “EnKF and 4D-Var Data Assimilation with a Chemistry Transport Model” by S. Skachko et al.

Anonymous Referee #2

Received and published: 3 June 2016

I am satisfied with the authors responses. I only suggest the following text be used instead of the added text on page C4 of the authors latest response (which incorrectly referred to the "4D-Var" window when describing the 4DEnKF approach):

"Other possibilities may be considered to properly compare two essentially different data assimilation systems. For example, the 4DEnKF (Hunt et al., 2004) approach could be used that computes 4D error covariances from the ensemble of forecasts at several times within the assimilation window. This would allow a longer assimilation window to be used in the EnKF experiment, making it more comparable to the configuration of 4D-Var. In this case, the EnKF analysis would be forced to simultaneously fit all of the observations distributed over a longer window, while still satisfying the model equations, as in 4D-Var. Applying the model error in this 4DEnKF only at the beginning of each assimilation window would make it similar to the strong-constraint version of

C1

4D-Var that was used."

Hunt, B. R., and Coauthors, 2004: Four-dimensional ensemble Kalman filtering. *Tellus*, 56A, 273–277.

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-95, 2016.

C2