

We would like to thank the editor for the final check and finding minor errors in our manuscript. We corrected equations 20-23 and addressed other minor comments. Regarding the comments of the editor on using sigma sign for covariance, we need to emphasize that this is not a summation, instead it is just a variable shown with this symbol. In the literature of Data Assimilation, the sigma sign is used to define the covariance. We use the same terminology to be consistent with the literature. Here we refer the editor to three pioneer papers in the DA that used the same symbol for defining the covariance (Anderson, 2001; Daescu and Langland, 2013; Moradkhani et al., 2005).

Anderson, J.L., 2001. An Ensemble Adjustment Kalman Filter for Data Assimilation. *Mon. Weather Rev.* 129, 2884–2903. [https://doi.org/10.1175/1520-0493\(2001\)129<2884:AEAKFF>2.0.CO;2](https://doi.org/10.1175/1520-0493(2001)129<2884:AEAKFF>2.0.CO;2)

Daescu, D.N., Langland, R.H., 2013. Error covariance sensitivity and impact estimation with adjoint 4D-Var: theoretical aspects and first applications to NAVDAS-AR. *Q. J. R. Meteorol. Soc.* 139, 226–241. <https://doi.org/10.1002/qj.1943>

Moradkhani, H., Sorooshian, S., Gupta, H.V., Houser, P.R., 2005. Dual state–parameter estimation of hydrological models using ensemble Kalman filter. *Adv. Water Resour.* 28, 135–147. <https://doi.org/10.1016/j.advwatres.2004.09.002>