Hydrology and Earth System Sciences Discussions

Interactive comment on "Ensemble Kalman filter versus ensemble smoother for assessing hydraulic conductivity via tracer test data assimilation" *by* E. Crestani et al.

Anonymous Referee #1

The authors present a comparison of the ensemble Kalman filter (EnKF) and the ensemble smoother (ES) applied to a low variability hydraulic conductivity field in a very idealistic case study for which concentration measurements are exhaustively know and measured at each simulation step. The authors compare different scenarios in which the state variable on which the EnKF and ES are applied are univariate transforms of the concentration.

The authors describe the results, but fail to give a good insight of why they come out that way. Why EnKF and ES perform so differently? Did you try an iterative ES? What

about the sensitivity of the results to measurement error? Why is the modified normal-score performing better than the unmodified one? Why did you choose such a low variability lnK field, for those cases the linearization of the state equations generally provides good approximations of the full equation, in which case you are filtering out the effect of a highly non-linear transfer function?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13083, 2012.