

Ensemble filtering in high-dimensional data assimilation

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In geophysical data assimilation, ensemble filtering is now considered a viable alternative to variational data assimilation. I will discuss two classes of ensemble filter algorithms.

The first one is particle filters. Although very efficient and conceptually attractive, they have not proven to be viable for complex systems because of the curse of dimensionality. But new ideas are emerging.

The second one is ensemble Kalman filters. They are currently shown to be perform well for complex systems (L. Bertino's talk). However, to work properly, they necessitate more or less established known as localisation and inflation to correct flaws of the original algorithm. In a perfect model context, inflation is mostly required to compensate for sampling errors due to the limited number of ensemble members. I will show how to build a class of EnKFs (the finite size ensemble Kalman filter, or EnKF-N) that do not need this type of inflation.