Numerical Aspects of Ensemble Square-root Kalman filters

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Ensemble square-root Kalman filters are currently the most widely used algorithms for sequential data assimilation. Over the recent years, a number of different algorithms have been introduced. These filters differ in the formulation of the analysis step, which combines the ensemble information from a numerical model with observational data. The relation of different filter algorithms will be discussed with a focus on numerical aspects. The discussion also motivates the new Error Subspace Transform Kalman Filter (ESTKF) that we have recently introduced.