Use of kernel regression in ensemble Kalman filters

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The ensemble Kalman filters are now widely used for data assimilation in nonlinear systems in various field. In the ensemble Kalman filters, the uncertainty in a system is represented by a set of possible scenarios called ensemble. An estimate of the system state is produced by a linear combination of the ensemble members. This procedure of the ensemble Kalman filters can be rewritten in a form of the kernel regression approach. A formulation based on the kernel regression approach enables us to allow a nonlinear relationship between the state and the observation. In this study, a formulation of the ensemble Kalman filters based on the kernel regression approach is introduced and some extentions of the ensemble Kalman filters are discussed.

Keywords: ensemble Kalman filter, kernel regression

