

Continuous data assimilation with multiplicative observation noise

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We consider continuous data assimilation for dissipative evolution equations in a Gelfand triple. The reference solution is observed only through finitely many modes and with multiplicative stochastic noise, and the approximate state is driven by a nudging feedback based on these observations. We prove conditions under which the nudged dynamics synchronises with the true signal. In particular, we obtain quantitative mean-square error estimates and almost sure synchronisation when the observation noise vanishes sufficiently along the reference trajectory. The abstract framework applies to weak and strong formulations of several PDEs, including 2D Navier-Stokes, quasi-geostrophic and magnetohydrodynamic equations. This is a joint work with J.Bröcker (Uni. Reading), F. Palma (Uni. Caserta), M. Hieber and T. Zöchling (TU Darmstadt).