Mathematics, Statistics, and Computer Science   **@ UIC**

Analysis and Applied Mathematics Seminar

Analysis of a feedback-control data assimilation algorithm

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Abstract: The purpose of this talk is to present some analysis results concerning a feedback-control (nudging) approach for data assimilation that works for a general class of dissipative dynamical systems and observables. First, I will consider the situation when the measurements are discrete in time and contaminated by systematic errors. In this case, we obtain an estimate for the error between the approximating solution and the reference solution that shows exponential convergence in time modulo the bound on the errors. Later, I will consider a numerical approximation of the nudging equation via the Postprocessing Galerkin Method, and show an analytical estimate of the truncation error committed in this finite-dimensional approximation. Most importantly, this error estimate is uniform in time. This is in contrast with the error estimate for the usual Galerkin approximation of the 2D Navier-Stokes equations, which grows exponentially in time. This talk is based on joint works with C. Foias and E. S. Titi.

Monday, April 17 at 4:00 PM in SEO 636