

1049-35-17

**Thomas R Bewley\*** ([bewley@ucsd.edu](mailto:bewley@ucsd.edu)), Dept of MAE, UC San Diego, La Jolla, CA 92037.

*Filtering, smoothing, and quasi-reversibility, and their relationship to the estimation and forecasting problems in chaotic PDE systems with diffusion.*

Motivated by problems ranging from global-scale weather forecasting and urban-scale contaminant plume forecasting all the way down to feedback flow control in agile unmanned aerial vehicles, it is often desirable to estimate the current state of a PDE system given an approximate model of the system and noisy measurements thereof.

This talk will begin with a review of the two existing classes of tractable “data assimilation” methods designed to estimate the state of such complex multiscale systems. We will then outline the new hybrid Ensemble/Variational Estimation (EnVE) approach which our lab has developed to address such problems, which consistently combines these two classes of methods in a clever way. We will focus in particular on the peculiar utility of approximate backwards-in-time marches of diffusive PDE systems in this setting. (Received January 17, 2009)