MMM SEMINAR SERIES

Developing data assimilation algorithms for the analysis and prediction of geophysical flows across many scales

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One of the biggest scientific challenges of our time is the accurate prediction of geophysical flows across many scales. Data assimilation plays an important role in furthering the understanding of these dynamical systems by combining the knowledge from observations and model forecasts. For a multiscale system, smaller scales feature more rapid and nonlinear error growth, which causes suboptimal performance for methods based on linearization such as the ensemble Kalman filter. High dimensionality of a multiscale system also limits the efficient use of nonlinear methods such as the particle filter. In this seminar talk, I will introduce a multiscale ensemble data assimilation method designed to crack these problems. The method is based on the idea of finding solution incrementally from large to small scales in an iterative manner, which is inspired by the computer vision literature. Consider when nonlinearity at small scales gives rise to position/timing errors of coherent features in the model state, the multiscale method performs data assimilation in large scale first, taking advantage of the fact that larger scales are more linear, and then utilize the analysis increments at larger scales to reduce the position errors (nonlinearity) at smaller scales. As a proof of concept, the multiscale method is tested with a quasi-geostrophic model. I will discuss the future development of multiscale methodology and its potential application to solving Earth-system prediction problems

Thursday, 6 June 2019, 3:30pm

Refreshments 3:15pm

NCAR-Foothills Laboratory, 3450 Mitchell Lane, FL2-1022, Large Auditorium

This seminar will be webcast live at:
http://ucarconnect.ucar.edu/live

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https://www.mmm.ucar.edu/events/seminars