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Education

- **Ph. D, December 2007**: Atmospheric and Oceanic Science Department, University of Maryland-College Park.
  Thesis: Applications of the LETKF to adaptive observations, analysis sensitivity, observation impact and assimilation of moisture
  Advisor: Eugenia Kalnay, URL: http://www.atmos.umd.edu/~ekalnay/
- **M. S., Spring 2003**: Nanjing Institute of Meteorology, China
  Thesis: The structure and the development mechanism of the low level vortex along the Mei-yu front.
  Advisor: Jin-Hai He and Yi-Hui Ding
- **B. S., 2000**: Nanjing Institute of Meteorology, China.

Research Experience

- Research Scientist-Jet Propulsion Lab, California Institute of Technology, March 2011-present
- Assistant Research Scientist – University of California-Berkeley, Feb 2010-Feb 2011
- Research Associate – University of California-Berkeley, Feb, 2008-Feb, 2010
- Research Assistant – University of Maryland-College Park, Sep, 2003-Feb, 2008

Honors and Awards

- Best Ph. D thesis award in Atmospheric and Oceanic Science department, University of Maryland, 2007
- Second place student paper award for "Application of Local Ensemble Transform Kalman Filter: Perfect model experiments with NASA fvGCM" in AMS 86th annual meeting held in Atlanta, GA, Jan. 28-Feb. 3, 2006

Publications

Selected Peer-Reviewed Literature

Liu, J., I. Fung, E. Kalnay, and J. Kang (2011), CO2 transport uncertainties from the uncertainties in meteorological fields, Geophys. Res. Lett., 38, L12808, doi:10.1029/2011GL047213.

Kang, J.-S., E. Kalnay, **J. Liu**, I. Fung, T. Miyoshi, and K. Ide (2011), "Variable localization" in an ensemble Kalman filter: Application to the carbon cycle data assimilation, *J. Geophys. Res.*, *116*, D09110, doi:10.1029/2010JD014673.

Li, H., **J. Liu**, and E. Kalnay, 2010: Correction of 'Estimating observation impact without adjoint model in an ensemble Kalman filter'. *Quart. J. Roy. Meteor. Soc.* 136, 1652-1654

Liu, J., E. Kalnay, T. Miyoshi, and C. Cardinali, 2009: Analysis sensitivity calculation within an ensemble Kalman filter. *Quart. J. Roy. Meteor. Soc.* **135,** 1842-1851

Liu, J., H. Li, E. Kalnay, E.J. Kostelich, and I. Szunyogh, 2009: Univariate and Multivariate Assimilation of AIRS Humidity Retrievals with the Local Ensemble Transform Kalman Filter. *Mon. Wea. Rev.*, **137**, 3918–3932.

Fertig, E. J., S.-J. Baek, B. R. Hunt, E. Ott, I. Szunyogh, J. A. Aravequia, E. Kalnay, H. Li, and **J. Liu**, 2009: Observation bias correction with an ensemble Kalman filter. *Tellus A*, **61**, 210-226.

Liu, J. and E. Kalnay, 2008: Estimating observation impact study without adjoint model in an ensemble Kalman filter. *Quart. J. Roy. Meteor. Soc,* **134***,* 1327-1335.

Liu, J., E. J. Fertig, H. Li, I. Szunyogh, B. Hunt, E. Kalnay, E. J. Kostelich, and R. Todling, 2008: Comparison between Local Ensemble Transform Kalman Filter and PSAS in the NASA finite volume GCM: perfect model experiments. *Nonlin. Processes in Geophys.*, 15, 645-659.

Liu, J. and E. Kalnay, 2007: Simple Doppler Wind Lidar (DWL) adaptive observation experiments with 3D-Var and an ensemble Kalman filter in a global primitive equations model. *Geophys. Res. Lett.*, **34**, L19808, doi: 10.1029/2007GL030707.

Liu, J., Y-H. Ding, and J-H. He, 2003: Analysis of typical Meiyu front structure in 1999.*Acta Meteorological Sinica*. **61**, 291-301.

Invited talks

Liu, J., 2010: Introduction to data assimilation and the applications of EnKF to carbon data assimilation. Workshop on Quantifying the Sources and Sinks of Atmospheric CO2. Keck Institute for Space studies, Caltech. Feb. 28-Mar. 5, 2010. **http://www.kiss.caltech.edu/workshops/carbon2009/schedule.html**

Liu, J. and E. Kalnay, 2009: Information Content in EnKF and the relation with Cross Validation. Workshop on Diagnostics of data assimilation system performance. ECMWF. 15-17 June, 2009.

http://www.ecmwf.int/newsevents/meetings/workshops/2009/Diagnostics_DA_System_Performance/presentations.html

Liu, J. and E. Kalnay, 2007: New applications of Ensemble Kalman Filter. National Centers for Environmental Prediction Environmental Modeling Center (EMC) seminar. Dec. 4th, http://www.emc.ncep.noaa.gov/seminars/

Li H., **J. Liu**, E. J. Fertig, H. Li, E. Kalnay: Comparison Between Local Ensemble Transform Kalman filter and PSAS in NASA finite volume GCM. (split between authors), Joint Center for Satellite Data Assimilation (JCSDA). March 15th, 2006
http://www.jcsda.noaa.gov/seminars/archive/JCSDASeminarKalneyEtAl031506B.ppt

Other papers and selected presentations

Liu, J., 2010: AIRS CO2 data assimilation with an EnKF in carbon climate model. 21-23, April, AIRS science team meeting, Pasadena, CA.

Liu, J., M. T. Chahine, I. Fung, E. Kalnay, E. T. Olsen, 2009: AIRS CO2 data assimilation with an EnKF. *Eos, Trans. AGU, 90(52)*, Fall meet. Suppl., Abstract A51A-0086

Liu, J., 2009: AIRS CO2 data assimilation with Ensemble Kalman. 4-7 May, AIRS science team meeting, Pasadena, CA.

Liu, J., E. Kalnay, H. Li, I. Szunyogh, and E. Kostelich, 2009: Univariate and multivariate assimilation of AIRS humidity retrievals with the Local Ensemble Transform Kalman filter. 89th AMS annual meeting, Phoenix, AZ, 11-14 Jan., 2009. http://ams.confex.com/ams/89annual/techprogram/paper_147800.htm

Liu, J., I. Fung, and E. Kalnay, 2008: Propagation of uncertainties from the assimilation of meteorological observations to CO2 forecast. *Eos, Trans. AGU, 90(52)*, Fall meet. Suppl., Abstract A43F-08

Liu, J., 2008: AIRS Humidity Assimilation with Ensemble Kalman Filter and Observation Impact Study Without Adjoint Model. 15-17 April, AIRS science team meeting, Pasadena, CA. http://airs.jpl.nasa.gov/documents/science_team_meeting_archive/science_team_meeting_2008.04.15/

Liu, J. and E. Kalnay, 2008: Estimation of observation impact without adjoint model in an ensemble Kalman filter. 88th AMS annual meeting. New Orleans, LA, 20-24 Jan. 2008 (6.3A) http://ams.confex.com/ams/88Annual/techprogram/paper_139923.htm

Liu, J. and E. Kalnay, 2008: Analysis sensitivity to the observations within an ensemble Kalman filter. 88th AMS annual meeting. New Orleans, LA, 20-24 Jan. 2008 (4.6A) http://ams.confex.com/ams/88Annual/techprogram/paper_135001.htm

Liu, J. and E. Kalnay, 2007: Adaptive observation experiments with a global model. 87th AMS annual meeting. San Antonio, Jan. 13-Jan. 18, 2007 (7.3)

Liu, J. and E. Kalnay, 2007: Assimilating specific humidity with Local Ensemble Transform Kalman Filter. San Antonio, Jan. 13-Jan. 18, 2007 (3.4) http://ams.confex.com/ams/pdfpapers/119461.pdf

Liu, J. and E. Kalnay, 2006: Assimilation precipitation with Local Ensemble Transform Kalman filter. Joint Assembly, Baltimore, MD, May 23- May 26, 2006 http://adsabs.harvard.edu/abs/2006AGUSM.H22B..01L

Liu, J., E. J. Fertig, H. Li, I. Szunyogh, B. Hunt, E. Kalnay, E. J. Kostelich, and R. Todling , 2006: Application of Local Ensemble Transform Kalman Filter: perfect model experiments with NASA fvGCM model. 86th AMS annual meeting. Atlanta, GA. Jan. 28-Feb. 3, (6.1) http://ams.confex.com/ams/pdfpapers/98475.pdf

Liu, J., E. Kalnay and T. Miyoshi, 2006: Adaptive observation strategies with the Local Ensemble Transform Kalman Filter. 86th AMS annual meeting. Atlanta, GA. Jan. 28-Feb. 3, (2.7)
http://ams.confex.com/ams/pdfpapers/98461.pdf

Professional Affiliations

Member, American Geophysical Union, 2004-
Member, American Meteorological Society, 2004-
Member, Chinese-American Oceanic and Atmospheric Association, 2004-