

Curriculum Vitae for Dr. Louis J. Wicker
Updated 09/30/08

Present Position

Research Scientist specializing in severe storm dynamics, convective-scale data assimilation, and computational physics at the National Severe Storms Laboratory in Norman, Oklahoma, June 1999 to present

Professional Positions

- Associate Adjunct Professor, Department of Meteorology, Texas A&M University, June 1999 to present
- CIMMS Fellow, Cooperative Institute for Mesoscale Meteorological Studies, University of Oklahoma, May 1999 to present
- Adjunct Associate Professor, School of Meteorology, University of Oklahoma, Spring 2000 to present.
- Associate Professor, Texas A&M Meteorology Department, August 1998 through May 1999
- Assistant Professor, Texas A&M Meteorology Department, August 1992 through July 1998
- Visiting Associate Research Scientist, National Center for Supercomputer Applications and the Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign. August 1990 through August 1992.

Education

- Ph.D. in Atmospheric Sciences
University of Illinois, August 1990
"A Numerical Study of a Tornado-Scale Vortex in a Three-Dimensional Cloud Model"
- M.S. in Meteorology
University of Oklahoma, June 1986
"A Simulation Study of a Data Assimilation Scheme Designed for VAS Temperature Soundings"
- B.S. in Meteorology
University of Oklahoma, December 1983

Referred Publications

- Wicker, L. J., 2009: New Adams-Bashforth-based split-explicit integrators for compressible atmospheric models. Submitted to *Mon. Wea. Rev.*, Accepted pending revision, Jan 16, 2009.
- Wandishin, M., D. Stensrud, S. Mullen, and L. J. Wicker, 2008: On the predictability of mesoscale convective systems: Three-dimensional simulations. Submitted to *Mon. Wea. Rev.*, December 20, 2008.
- Stensrud, D., M. Xue, L. J. Wicker, K. E. Kelleher, M. P. Foster, J. T. Schaefer, R. S. Schneider⁴, S. G. Benjamin, S. S. Weygandt, J. T. Ferree, and J. P. Tuell, 2008: Convective-scale Warn on Forecast: A Vision for 2020. Submitted to the *Bull. Amer. Meteor. Soc.*, Dec 8, 2008
- Dowell, D. C., and L. J. Wicker, 2008: Additive noise for storm-scale ensemble forecasting and data assimilation. *J. Atmos. Ocea. Tech.* Accepted for publication, September 29, 2008.
- French, M., H. B. Bluestein, D. C. Dowell, L. J. Wicker, M. R. Kramer, and A. L. Pazmany, 2008: An example of the use of mobile, Doppler radar data in tornado verification. *Mon. Wea. Rev.*, *In press*.
- French, M., H. B. Bluestein, D. C. Dowell, L. J. Wicker, M. R. Kramer, and A. L. Pazmany, 2008: High-resolution, mobile, Doppler observations of cyclic mesocyclogenesis in a supercell. *Mon. Wea. Rev.*, **136**, 4997–5016. DOI: 10.1175/2008MWR2407.1.
- Wandishin, M., D. Stensrud, S. Mullen, and L. J. Wicker, 2008: On the predictability of mesoscale convective systems: Two-dimensional simulations. *Weather and Forecasting*, **23**, 773–785. DOI: 10.1175/2008WAF2007057.1
- Fierro, A. O, M. S. Gilmore, L. J. Wicker, E. R. Mansell, and J. M. Straka, 2006: Electrification and lightning in an idealized boundary-crossing supercell simulation of 2 June 1995. *Mon. Wea. Rev.*, **134**, 3149-3171.
- Coniglio, M. C., D. J. Stensrud, and L. J. Wicker, 2006: Role of upper-level shear on the structure and maintenance of strong quasi-linear mesoscale convective systems. *J. Atmos. Sci.*, **63**, 1231–1252.
- Biggerstaff, M. I., L. J. Wicker, J. Guynes, C. Ziegler, J. M. Straka, E. N. Rasmussen, A. Doggett IV, L. D. Carey, and J. L. Schroeder, 2005: The shared mobile atmospheric research and teaching (SMART) radar: A collaboration to enhance research and teaching. *Bulletin of the Amer. Meteor. Soc.*, **86**, 1263-1274.
- Dowell, D. C., C. R. Alexander, J. M. Wurman, and L. J. Wicker, 2005: Reflectivity patterns and wind-measurement errors in high-resolution radar observations of tornadoes. *Mon. Wea. Rev.*, **133**, 1501–1524.
- Dowell, D. C., F. Zhang, L. J. Wicker, C. Snyder, and N. A. Crook, 2004: Wind and thermodynamic retrievals in the 17 May 1981 Arcadia, Oklahoma supercell: Ensemble Kalman filter experiments. *Mon. Wea. Rev.*, **132**, 1982-2005.

- Peckham, Steven E., R. B. Wilhelmson, L. J. Wicker, and Conrad L. Ziegler, 2004: Numerical simulation of the interaction between the dryline and horizontal convective rolls. *Mon. Wea. Rev.*, **132**, 1792–1812.
- Brooks, H., C. Doswell III, D. Dowell, R. Holle, B. Johns, D. Jorgensen, D. Schultz, D. Stensrud, S. Weiss, L. Wicker, and D. Zaras, 2003: Severe thunderstorms and tornadoes. Handbook of Weather, Climate, and Water: Dynamics, Climate, Physical Meteorology, Weather Systems, and Measurements. T. D. Potter and B. R. Colman, Eds., Wiley-Interscience, 575--619.
- Gilmore, M. S., and L. J. Wicker, 2002: Influences of the local environment on supercell cloud-to-ground lightning, radar characteristics, and severe weather on 2 June 1995. *Mon. Wea. Rev.*, **130**, 2349-2372.
- Wicker, L. J., and W. C. Skamarock, 2002: Time-splitting methods for elastic models using forward time schemes. *Mon. Wea. Rev.* **130**, 2088–2097.
- Wilhelmson, R. B., and L. J. Wicker, 2002: Numerical modeling of severe storms. *Meteor. Monogr. C.* A. Doswell III, Ed., American Meteorological Society, 123-166.
- Peckham, S. E. and L. J. Wicker, 2000: The influence of topography and lower-tropospheric winds on dryline evolution. *Mon. Wea. Rev.* **128**, 2165-2189.
- Atkins, N. T., M. L. Weisman, L. J. Wicker, 1999: The influence of preexisting boundaries on supercell evolution. *Mon. Wea. Rev.*, **127**, 2910–2927.
- Wicker, L. J., and W. C. Skamarock, 1998: A time splitting scheme for the elastic equations incorporating second-order Runge-Kutta time differencing. *Mon. Wea. Rev.*, **126**, 1992–1999.
- Gilmore, M., and L. J. Wicker, 1998: The influence of midtropospheric dryness on supercell morphology and evolution. *Mon. Wea. Rev.*, **126**, 943-958.
- Wicker, L. J., M. P. Kay, and M. P. Foster, 1997: STORMTIPE-95: A convective storm forecast experiment. *Weather and Forecasting*, **12**, 427-436.
- Perez, A., L. J. Wicker, and R. E. Orville, 1997: Characteristics of cloud-to-ground lightning associated with violent tornadoes. *Weather and Forecasting*, **12**, 401-410.
- Nielsen-Gammon, J. W., M. I. Biggerstaff, M. E. Alcorn, D. Austin, K. B. Bowman, D. Djuric, J. Guynes, R. White, and L. J. Wicker, 1996: Texas A&M university's laboratory for the exploration of atmospheric processes - TAMU's LEAP. *Bulletin of the Amer. Meteor. Soc.*, **77**, 2907-2918.
- Wicker, L. J., and R. B. Wilhelmson, 1995: Simulation and analysis of tornado development and decay within a three-dimensional supercell thunderstorm. *J. of Atmos. Sci.*, **52**, 2675-2703.
- Wicker, L. J., and R. B. Wilhelmson, 1993: Numerical simulation of tornadogenesis within a supercell thunderstorm. *The tornado: Its structure, dynamics, prediction, and hazards*. AGU Monograph Series, C. R. Church (Ed.). **79**, 75-88.

H. E. Brooks, L. J. Wicker and C. A. Doswell III, 1993: STORMTIPE: A forecasting experiment using a three-dimensional cloud model. *Weather and Forecasting*, **8**, 352-362.

Straka, J. M., R. B. Wilhelmson, L. J. Wicker, J. A. Anderson, K. K. Droegemeier, 1993: Numerical solutions of a non-linear density current: A benchmark solution and comparisons. *International Journal of Numerical Methods in Fluids*, **17**, 1-22.

Wilhelmson, R. B., B. Jewett, C. Shaw, L. Wicker, M. Arrott, C. Bushnell, M. Bajuk, and J. Yost, 1990: A study of a numerically model severe storm. *International Journal of Supercomputing Applications*. **4**, **2**. Video Edition, 20-36.

Conference Abstracts and Papers

Crowell, S., D. Williams, C. Mavriplis and L. Wicker, 2009: Comparison of Traditional and Novel Discretization Methods for Advection Models in Numerical Weather Prediction. *ICCS conference on numerical methods*. Baton Rouge LA May 25-27, 2009.

Wicker, L. J., 2008: The Role of Near-Surface Wind Shear on Low-Level Mesocyclone Generation and Tornadoes: Renascentia. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

Gilmore, M and R. B. Wilhelmson, L. J. Wicker, and G. S. Romine, 2008: Understanding the balance of forces in a long-lived simulated supercell-spawned tornado. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

Orf, L., M. S. Gilmore, J. M. Straka, R. B. Wilhelmson, L. J. Wicker, and E. N. Rasmussen, 2008: Descending Reflectivity Cores in a simulated supercell. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

Mansell, E. R., L. J. Wicker, 2008: EnKF analysis and forecast predictability of a tornadic supercell Storm. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

Biggerstaff, M. I., D. W. Burgess, G. D. Carrie, E. R. Mansell, L. J. Wicker, and C. L. Ziegler, 2008: Storm-scale sampling strategies for the mobile C-band Doppler radars during VORTEX2. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

Thompson, T., L. Wicker, K. Kuhlman, M. Biggerstaff, 2008: Comparison of Three-dimensional Winds Derived from Assimilated Phased Array Radar Data with Mobile Dual-Doppler Analyses from a Tornadic Storm. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

Ziegler C., K. Kuhlman, M. Biggerstaff, D. Betten, L. Wicker, E. Mansell, and D. MacGorman, 2008: Evolution of low-level rotation in the tornadic 29 May 2004 Geary, Oklahoma supercell storm. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

French, M., H. B. Bluestein, D. C. Dowell, L. J. Wicker, M. R. Kramar, and A. L. Pazmany, 2008: High-resolution, mobile Doppler radar observations of cyclic mesocyclogenesis in a supercell. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

Tanamachi, R., L. J. Wicker, D. C. Dowell, H. B. Bluestein, S. Frasier, K. Hardwick, 2008: X-band, mobile Doppler radar data collected in a tornadic thunderstorm: Data assimilation experiments. *Abstract submitted to the 23rd Conf. on Severe Local Storms*, Savannah GA, Amer. Meteor. Soc.

- Coniglio, M. C., D. C. Dowell, L. J. Wicker, 2007: Ensemble Kalman filter assimilation of Doppler radar data: Analyses of a developing MCS. Extended Abstracts, 22nd Conference on Weather Analysis and Forecasting/18th Conference on Numerical Weather Prediction, Park City, UT, USA, American Meteorological Society, 3B.3. <http://ams.confex.com/ams/pdfpapers/124285.pdf>
- St-Cyr, A., C. Mavriplis, and L. Wicker, 2007: Jacobian-free rosenbrock time-stepping for compressible geophysical flows. *International Conference on Computational Science*. Beijing, China. May 27-30. [Abstract and presentation](#).
- Mavriplis, C., and L. Wicker, 2007: Towards an adaptive discontinuous galerkin method for mesoscale modeling. *SIAM Conference on High Resolution Modeling in the Geosciences*. Santa Fe, NM March 22-24. [Abstract and presentation](#).
- French, M. M, H. B. Bluestein, D. C. Dowell, L. J. Wicker, M. R. Kramer, and A. L. Pazmany, 2005: The 15 May 2003 Shamrock, Texas, supercell: A dual-Doppler analysis and EnKF data-assimilation experiment. Paper **10R.2**, *Preprints, 11th Conf. On Mesoscale Processes*. Albuquerque, NM. Amer. Meteor. Soc.
- Coniglio, M. C., D. C. Dowell, L. J. Wicker, and D. J. Stensrud, 2005: Impact of Doppler radar and mesoscale surface observations on the storm-scale analysis and prediction of a mesoscale convective system. Paper **JP1J.2**, *Preprints, 11th Conf. On Mesoscale Processes*. Albuquerque, NM. Amer. Meteor. Soc.
- Weiss, S., J. Kain, L. Wicker, B. Davies-Jones, D. Bright, J. Levit, G. Carbin, M. Baldwin, 2005: Evaluating the skill of daily explicit predictions of mesocyclones in multiple high-resolution WRF model forecasts during the 2005 SPC/NSSL Spring Program. Paper **2M.2**, *Preprints, 11th Conf. On Mesoscale Processes*. Albuquerque, NM. Amer. Meteor. Soc.
- Burgess, D. W., D. C. Dowell, L. J. Wicker, and A. Witt, 2005: Detailed comparison of observed and modeled tornadogenesis. Paper **10.4**, *Preprints, 32nd Conf. On Radar Meteorology*. Albuquerque, NM. Amer. Meteor. Soc.
- Gilmore, M., R. Patterson, G. Romine, L. J. Wicker, R. B. Wilhelmson, Al. Betts, D. Cox, L. Counce, M. Hall, L. Leonard, S. Levy, and M. A. Straka., 2004: Behind the "supertwister": experiences in science education at NCSA. Paper **P6.5**, *Preprints, 22nd Conf. on Severe Local Storms*, Hyannis, MA, Amer. Meteor. Soc.
- Wicker, L. J., and D. C. Dowell, 2004: High-resolution analyses of the 8 May 2003 Oklahoma City storm. Part III: An ultra-high resolution forecast experiment. Paper **12.6**, *Preprints, 22nd Conf. on Severe Local Storms*, Hyannis, MA, Amer. Meteor. Soc.
- Dowell, D. C., and L. J. Wicker, 2004: High-resolution analyses of the 8 May 2003 Oklahoma City storm. Part II: EnKF data assimilation and forecast experiments. Paper **P10.3**, *Preprints, 22nd Conf. on Severe Local Storms*, Hyannis, MA, Amer. Meteor. Soc.
- Fierro, A., M. Gilmore, L. Wicker, E. Mansell, J. Straka, E. Rasmussen. 2004: Electrification and lightning in an idealized boundary-crossing supercell simulation of 2 June 1995. Paper 16B7, *Preprints, 22nd Conf. on Severe Local Storms*, Hyannis, MA, Amer. Meteor. Soc.
- French, M. H. Bluestein, D. Dowell, L. Wicker, M. Kramer, A. Pazmany, 2004: Mobile, dual-doppler analysis of tornadogenesis: The 15 May 2003 supercell in Skamarock Texas. Paper **P10.3**, *Preprints, 22nd Conf. on Severe Local Storms*, Hyannis, MA, Amer. Meteor. Soc.
- Stensrud, D.J., and L. J. Wicker, 2004: On the predictability of mesoscale convective systems. Preprints, International Conference on Storms, Brisbane, Australia, Aust. Meteor. Ocean. Society, 62-67.
- Peckham, S., R. B. Wilhelmson, L. J. Wicker, and C. L. Ziegler, 2002: Numerical simulation of the interaction between the dryline and horizontal convective rolls. *Preprints, 21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., 291-294

- Wicker, L. J., R. B. Wilhelmson, D. Dowell, Y. Richardson, 2002: A large eddy simulation of a tornadic supercell: Comparison with observations. *Preprints, 21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., 262-263
- Wilhelmson, R. B., L. J. Wicker, S. E. Peckham, P. Woodward, S. Anderson, D. Porter, and C. Shaw, 2002: High Resolution Simulation of the Development and Structure of a Tornado and Its Parent Supercell. *Preprints, 21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., 259-261.
- Gilmore, M. S., L. J. Wicker, S. E. R. Mansell, J. M. Straka, E. N. Rasmussen, 2002: Idealized Boundary-Crossing Supercell Simulations of 2 June 1995. *Preprints, 21st Conf. on Severe Local Storms*, San Antonio, TX, Amer. Meteor. Soc., 251-254
- Dowell, D. F. Zhang, L. Wicker, C. Snyder, B. Skamarock, and A. Crook, 2002: Wind and Thermodynamic Retrievals in a Supercell Thunderstorm: Ensemble Kalman Filter Results. *Preprints, 15th Conf. on Numerical Weather Prediction*, San Antonio, TX, Amer. Meteor. Soc., 375-378.
- Wicker, L. J., M. S. Gilmore, E. N. Rasmussen, and J. M. Straka, 2001: Influences of the Local Environment on Supercell Cloud-to-Ground Lightning, Radar Characteristics, and Severe Weather on 2 June 1995, *Eos Trans. AGU*, 82(47), Fall Meet. Suppl., Abstract AE12A-87
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- Dowell, D. C., L. J. Wicker, and A. Shapiro: 2001: Thermodynamic retrieval experiments with a 2-D model. *Preprints, 30th International Conf. on Radar Meteorology*. Munich, Germany. American Meteorological Society. 191-193.
- Peckham, S. E., R. B. Wilhelmson, L. J. Wicker, and C. L. Ziegler, 2000: Numerical simulation of the interaction between the dryline and horizontal convective roles. *Preprints, 14th Conf. on Boundary Layer Turbulence* American Meteorological Society. 210-211.
- Wicker, L.J., and R. Carver, 2000: The role of low-level shear, mid-level shear, and CAPE in low-level mesocyclone generation. *Preprints, 20th Conf on Severe Local Storms*, Orlando, FL., American Meteorological Society. 587-590.
- Wicker, L. J., and D. C. Dowell, 2000: A numerical study of cyclic tornadogenesis: The 8 June 1995 Case. *Preprints, 20th Conf on Severe Local Storms*, Orlando, FL., American Meteorological Society. 263-264.
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- Wilhelmson, R., M. Arrott, L. Wicker, D. Wojtowicz, C. Shaw, B. Lee, B. Jewett, M. Bajuk, M. McNeil, J. Terstriep, and V. Jaswal 1996: Visualization of storm and tornado development for an OMNIMAX film and for the CAVE. *Preprints, 12th International Conf. on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology*. Atlanta, GA, American Meteorological Society, 135-138.

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