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Vita
Robert B. Wilhelmson
Professor of Meteorology - Department of Atmospheric Sciences
Chief Scientist - National Center for Supercomputing Applications (NCSA)

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Professional Preparation

Wheaton College, Illinois	Mathematics	B.S., 1966
University of Illinois at Urbana-Champaign	Computer Science	M.S., 1969
University of Illinois at Urbana-Champaign	Computer Science	Ph.D., 1972

Academic and Professional Appointments

1966–69	Research Assistant, Computer Science Department, U. of Illinois
1969–72	Research Assistant, Laboratory for Atmospheric Research, U. of Illinois
1972–74	Research Assistant Professor, Laboratory for Atmospheric Research & Center for Advanced Computation, U. of Illinois
1974–78	Assistant Professor, Laboratory for Atmospheric Research & Center for Advanced Computation, U. of Illinois
1978–83	Associate Professor, Laboratory for Atmospheric Research, U. of Illinois
1983–present	Professor, Department of Atmospheric Sciences, U. of Illinois
1985–86	Assistant Director, NCSA, U. of Illinois
1986–87	Associate Director, NCSA, U. of Illinois
1987–present	Senior Research Scientist, NCSA
1993–94	Department Head, Department of Atmospheric Sciences
1996–99	Department Head, Department of Atmospheric Sciences
1996–2000	Co-lead of the Environmental Hydrology Team at NCSA
2000–2002	Lead for the Environmental Hydrology Team at NCSA
2002–2004	CoLead for Alliance Expedition entitled "Modeling Environment for Atmospheric Discovery"
2003–present	CoLEAD for LEAD
2004–present	Chief Scientist and Associate Director of Cyber Applications and Communities, NCSA

Awards

1979	NCAR Outstanding Publication Award with Dr. Klemp
1983,	AMS Meisinger Award with Dr. Klemp
1989	"Study of a Numerically Modeled Severe Storm" received the First Place Visualization Award at "The Computer Graphics Film Festival 1989" held in London, England and subsequently was submitted for an Academy Award.
1990	Fellow of the American Meteorological Society
1996	NOAA/ERL Outstanding Publication Award with Dr. Brooks

Memory Lane

1970	One of the first scientists to use the internet (e.g. ARPANET) to carry our research from the University of Illinois using an IBM computer in California.
1989	Participated in the first live scientific teleconference between NCSA and the Boston Museum of Science during SIGGRAPH '89 using AT&T satellite football broadcast capabilities
1975	One of the first scientists to simulate a supercell in collaboration with Joe Klemp at NCAR
1984	Co-PI on the unsolicited proposal to NSF that led to NSF's supercomputing programs
1989	Academy Award nominee (Science Director) for "The Study of a Numerically Modeled Severe Storm"
1996	Development of interactive virtual reality visualizations for modeled severe storm data within a four wall CAVE in collaboration with NCSA staff

2003 Storm Group at UIUC simulated for the first time a long-lived tornado (> 45 minutes on the ground) and the appearance of a counter-rotating tornadoes that moved around the long-lived tornado

2004 The first HDTV visualization of a storm/tornado simulation for NOVA using 4 Tbytes of data from the above simulation in collaboration with the UIUC Storm Group, NCSA staff, and NSSL/NOAA

2005 Tornado visualization with the UIUC Storm Group and NCSA staff used on the cover of the report to the president on Coomputational Science: Ensuring America's Competitiveness

Thesis Advisor and Postgraduate-Scholar Sponsor
Total Graduate Students (14) and Post-Docs (3): M. Bradley, H. Brooks, C-S Chen, S. Chin, L. Cronce, K. Droegemeier, M. Gilmore, A. Houston, B. Lee, B. Jewett, E. Mlodzik, L. Muñoz, G. Romine, S. Peckham, L. Wicker, B. Zhou

UCAR Committees
1975–77 Member of the Advisory Committee for NCAR Small-Scale Analysis & Prediction Project
1984–86 UNIDATA Management Advisory Committee
1986–88 UNIDATA Steering Committee
1999–2003 Digital Library for Earth System Education (DLESE) Steering Committee
2000–present WRF Science Board

Publications and Grants
Dr. Wilhelmson is the lead or co-author of over 45 peer reviewed publications and many conference and workshop proceedings. He has also served as PI or co-PI on over 30 grants from NSF, NASA, and NOAA, some exceeding $50 million dollars.

Books

Wilhelmson, R. B. (Editor), 1988: Edited *Proceedings* for workshop entitled "Scientific Applications and Algorithm Design for High Speed Computing," Urbana, Illinois, April 7–11, 1986, sponsored by the National Center for Supercomputing Applications, the Center for Supercomputing Research and Development and Cray Research. High-Speed Computing, University of Illinois Press, 228pp.

Book Chapters

Wilhelmson, R. B., 1988: Numerical simulations of severe storms in Science and Engineering on Cray Supercomputers: *Proceedings,* 4th International Symposium. Cray Research, Inc., Minneapolis, MN, 329–345.

Wilhelmson, R. B., and L. J. Wicker, 2001: Severe storm modeling. *Severe Convective Storms, Meteor. Monogr.,* **28**, No. 50, Amer. Meteor. Soc., 123-166.

Middleton, D., R. B. Wilhelmson, and T. Scheitlin, 2004: Visualization in Weather and Climate Research, VISUALIZATION HANDBOOK, Edited by Christopher R. Johnson and Charles D. Hansen.

Peer Reviewed Publications

Wilhelmson, R., and Y. Ogura, 1972: The pressure perturbation and numerical modeling of a cloud. *J. Atmos. Sci.*, **29**, 1295–1307.

Wilhelmson, R., 1974: The life cycle of a thunderstorm in three dimensions. *J. Atmos. Sci.*, **31**, 1629–1651.

Ericksen, J. H., and R. Wilhelmson, 1976: Implementation of a convective problem requiring auxiliary storage. *ACM Trans. on Math. Software,* **2**, 187–195.

Wilhelmson, R., 1977: On the thermodynamic equation for deep convection. *Mon. Wea. Rev.*, **105**, 545–549.

Wilhelmson, R., and J. Ericksen, 1977: Direct solutions for Poisson's equation in three dimensions. *J. Comput. Phys.*, **25**, 319–331.

Klemp, J. B., and R. Wilhelmson, 1978: The simulation of three-dimensional convective storm dynamics. *J. Atmos. Sci.*, **35**, 1070–1096.

Klemp, J. B., and R. Wilhelmson, 1978: Simulations of right- and left-moving storms produced through storm splitting. *J. Atmos. Sci.*, **35**, 1097–1110.

Wilhelmson, R., and J. B. Klemp, 1978: A numerical study of storm splitting that leads to long-lived storms. *J. Atmos. Sci.*, **35**, 1974–1986.

Hane, C. E., R. B. Wilhelmson and T. Gal-Chen, 1981: Retrieval of thermodynamic variables within deep convective clouds: Experiments in three dimensions. *Mon. Wea. Rev.*, **109**, 564–576.

Klemp, J. B., R. B. Wilhelmson and P. S. Ray, 1981: Observed and numerically simulated structure of a mature supercell thunderstorm. *J. Atmos. Sci.*, **38**, 1558–1580.

Wilhelmson, R. B., and J. B. Klemp, 1981: A three-dimensional numerical simulation of splitting severe storms on 3 April 1964. *J. Atmos. Sci.*, **38**, 1581–1600.

Ray, P. S., B. C. Johnson, K. W. Johnson, J. S. Bradberry, J. J. Stephens, K. K. Wagner, R. B. Wilhelmson and J. B. Klemp, 1981: The morphology of several tornadic storms on 20 May 1977. *J. Atmos. Sci.*, **38**, 1643–1663.

Wilhelmson, R. B., and C.-S. Chen, 1982: A simulation of the development of successive cells along a cold outflow boundary. *J. Atmos. Sci.*, **39**, 1466–1483.

Ray, P. S., R. B. Wilhelmson and K. W. Johnson, 1982: Model of a tornadic thunderstorm. *Bull. Amer. Met. Soc.*, **63**, 304.

Ray, P. S., J. B. Klemp and R. B. Wilhelmson, 1982: Observed and numerically simulated structure of a mature supercell thunderstorm. In *Cloud Dynamics*, ed. E. M. Agee and T. Asai, D. Reidel Publishing Company, pp. 379–393.

Droegemeier, K. K., and R. B. Wilhelmson, 1985: Three-dimensional numerical modeling of convection produced by interacting thunderstorm outflows. Part I. Control simulation and low-level moisture variations. *J. Atmos. Sci.*, **42**, 2381–2403.

Droegemeier, K. K., and R. B. Wilhelmson, 1985: Three-dimensional numerical modeling of convection produced by interacting thunderstorm outflows. Part II. Variations in vertical wind shear. *J. Atmos. Sci.*, **42**, 2404–2414.

Droegemeier, K. K., and R. B. Wilhelmson, 1986: Kelvin-Helmholtz instability in a numerically simulated thunderstorm outflow. *Bull. Amer. Meteor. Soc.*, **67**, cover and 416–417.

Droegemeier, K. K., and R. B. Wilhelmson, 1987: Numerical simulation of thunderstorm outflow dynamics. Part I: Outflow sensitivity experiments and turbulence dynamics. *J. Atmos. Sci.*, **44**, 1180–1210.

Wilhelmson, R. B., B. Jewett, C. Shaw, L. Wicker, M. Arrott, M. Bajuk, C. Bushell, J. Thingvold, and J. Yost, 1990: A study of the evolution of a numerically modeled severe storm. *International Journal of Supercomputing Applications,* **4**, Summer, 20–36.

Wilhelmson, R. B. 1991: Environmental studies using Cray Research supercomputers at NCSA. *Cray Channels*, Winter 1991, 10–14.

Brooks, H. E., and R. B. Wilhelmson, 1992: Numerical simulation of a low-precipitation supercell thunderstorm. *Meteorology and Atmospheric Physics,* **49**, 3–17.

Brooks, H. E., and R. B. Wilhelmson, 1993: Hodograph curvature and updraft intensity in numerically modelled supercells. *J. Atmos. Sci.*, **50**, 1824–1833.

Straka, J. M., R. B. Wilhelmson, L. J. Wicker, J. R. Anderson and 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.

Wicker, L. J., and R. B. Wilhelmson, 1993: Numerical simulation of tornadogenesis within a three-dimensional supercell thunderstorm. *The Tornado: Its Structure, Dynamics, Prediction and Hazards,* AGU Monograph Series, C.R. Church (Ed.), **79**, 75–88.

Brooks, H. E., C. A. Doswell III and R. B. Wilhelmson, 1994: The role of mid-tropospheric winds in the evolution and maintenance of low-level mesocyclones. *Mon. Wea. Rev.*, **122**, 126–136.

Wilhelmson, R. B., D. P. Wojtowicz, C. Shaw, J. Hagedorn, and S. Koch, 1995: NCSA PATHFINDER: Probing ATmospHeric Flows in an INtegrated and Distributed EnviRonment. AGU Special Publication.

Wicker, L. J., and R. B. Wilhelmson, 1995: Simulation and analysis of tornado development and decay within a three-dimensional supercell thunderstorm. *J. Atmos. Sci.*, **52**, 2675–2703.

Lee, B. D., and R. B. Wilhelmson, 1997: The numerical simulation of non-supercell tornadogenesis: Part I: Initiation and evolution of pretornadic misocyclone circulations along a dry outflow boundary. *J. Atmos. Sci.,* **54**, 32–60.

Lee, B. D., and R. B. Wilhelmson, 1997: The numerical simulation of non-supercell tornadogenesis, Part II: Evolution of a family of tornadoes along a weak outflow boundary. *J. Atmos. Sci.,* **54**, 2387–2415.

Chin, H.-N. S., and R. B. Wilhelmson, 1998: Evolution and structure of tropical squall line elements within a moderate CAPE and strong low-level jet environment. *J. Atmos. Sci.,* **55**, 3089–3113.

Lee, B. D., and R. B. Wilhelmson, 2000: The numerical simulation of non-supercell tornadogenesis, Part III: Parameter tests investigating the role of CAPE, vortex sheet strength and boundary layer vertical shear. *J. Atmos. Sci.,* 57, 2246–2261.

Orf, L. G. and R. B.Wilhelmson (2002). Modeling Flanking Lines of Supercells. Nowcast, Bull. of the Amer. Met. Soc., 1124-1125.

Peckham, S. E., R. B. Wilhelmson, L. J. Wicker, and C. L. Ziegler, 2004: Numerical simulation of the Interaction between the dryline and horizontal convective rolls. *Mon. Wea. Rev.***, 132**, 1792–1812.

Droegemeier, K., K. Brewster, M. Xue, D. Weber, D. Gannon, B. Plale, D. Reed, L. Ramakrishnan, J. Alameda, R. Wilhelmson, T. Baltzer, B. Domenico, D. Murray, A. Wlson, R. Clark, S. Yalda, S. Graves, R. Ramachandran, J. Rushing, E. Joseph, "Service-oriented environments for dynamically interacting with mesoscale weather", *Computing in Science and Engineering*, IEEE Computer Society Press and American Institute of Physics, Vol. 7, No. 6, pp. 12-29, 2005.

Plale, Beth, Dennis Gannon, Yi Huang, Gopi Kandaswamy, Sangmi Pallickara, and Aleksander Slominski, 2005: "Cooperating Services for Managing Data Driven Computational Experimentation", *Computing in Science and Engineering*, IEEE Computer Society Press and American Institute of Physics, Vol. 7, No. 5, pp. 34-43, 2005. http://doi.ieeecomputersociety.org/10.1109/MCSE.2005.91

Plale, Beth, Dennis Gannon, Jay Alameda, Bob Wilhelmson, Shawn Hampton, Al Rossi, and Kelvin Droegemeier, 2005: Active Management of Scientific Data. *IEEE Internet Computing special issue on Internet Access to Scientific Data*, Vol. 9, No. 1, Jan/Feb 2005, pp. 27-34.

Jewett, B. F., and R. B. Wilhelmson, 2006: The role of forcing in cell morphology within midlatitude squall lines. *Mon. Wea. Rev.,* **134**, 3714-3734.

Lee, B. D., B. F. Jewett, and R. B. Wilhelmson, 2006: The 19 April 1996 Illinois tornado outbreak. Part I: Cell initiation, evolution and supercell isolation. *Wea. Forecasting*, **21**, 433-448.

___, ___, and ___, 2006: The 19 April 1996 Illinois tornado outbreak. Part II: Cell mergers and associated tornado incidence. *Wea. Forecasting*, **21**, 449-464.

Romine, G. S. and R. B. Wilhelmson, 2006: Small-scale spiral band features within a numerical simulation of Hurricane Opal (1995). *Mon. Wea. Rev.***, 134**, 1121-1136.

Plale, Beth, Dennis Gannon, Jerry Brotzge, Kelvin Droegemeier, Jim Kurose, David McLaughlin, Robert Wilhelmson, Sara Graves, Mohan Ramamurthy, Richard D. Clark, Sepi Yalda, Daniel A. Reed, Everette Joseph, and V. Chandrasekar, 2006: CASA and LEAD: Adaptive Cyberinfrastructure for Real-Time Multiscale Weather Forecasting *Computer*, Vol. 39, No. 11, pp. 56-64, IEEE Computer Society, Los Alamitos, CA, USA, http://doi.ieeecomputersociety.org/10.1109/MC.2006.375, Nov 2006.

Plale, B., D. Gannon, J. Brotzge, K. Droegemeier, J. Kurose, D. McLaughlin, R. Wilhelmson, S. Graves, M. Ramamurthy, R.D. Clark, S. Yalda, D.A. Reed, E. Joseph, V. Chandrasekar, 2006. CASA and LEAD: Adaptive Cyberinfrastructure for Real-Time Multiscale Weather Forecasting, *Computer special issue on System-Level Science*, IEEE Computer Science Press, Vol. 39, No. 11, pp. 56-63.

Houston, A. L and R. B. Wilhelmson, 2007: Observational analysis of the 27 May 1997 central Texas tornadic event. Part I: Pre-storm environment and storm maintenance/propagation. *Mon. Wea. Rev.,* Accepted.

Houston, A. L and R. B. Wilhelmson, 2007: Observational analysis of the 27 May 1997 central Texas tornadic event. Part II: Tornadoes. *Mon. Wea. Rev.,* Accepted

Orf, L. and R. B. Wilhelmson, 2007: Vortex Detection in a Simulated Supercell Thunderstorm. Atmospheric Science Letters. Accepted

Cronce, L. M., M. S. Gilmore, R. B. Wilhelmson, and J. M. Straka, 2007: Hail embryo differences between simulated High Plains and Oklahoma storms. *Mon. Wea. Rev. In Preparation.*

Other Publications

Wilhelmson, R. B., Abel, et al., 1969: Tranquil: A language for array processing computer. *Spring Joint Computer Conf.*, 57-B.

Wilhelmson, R. B., 1973: The life cycle of a thunderstorm—three dimensions. *Preprints*, 8th Conf. on Severe Local Storms, 279–286.

Wilhelmson, R. B., 1974: Solving Partial Differential Equations using ILLIAC IV. *Lecture Notes in Mathematics.* Constructive and Computational Methods for Differential and Integral Equations. Symposium sponsored by the Air Force Office of Scientific Research, Indiana University, February 17–20, 453–476.

Klemp, J. B., and R. B. Wilhelmson, 1977: The simulation of three-dimensional convective storm dynamics. *Preprints*, 10th Conf. on Severe Local Storms, 283–289.

Wilhelmson, R. B., and J. B. Klemp, 1978: The influence of microphysical processes on storm splitting and structure. *Preprints*, Conf. on Cloud Physics and Atmospheric Electricity, 540–543.

Klemp, J. B., R. B. Wilhelmson, P. S. Ray, J. Stokes, B. Johnson and K. Johnson, 1979: Comparison of modeled and observed severe storms. *Preprints*, 11th Conf. on Severe Local Storms, 515–522.

Wilhelmson, R. B., and J. B. Klemp, 1979: The effect of gust fronts on the generation of multiple splitting storms. *Preprints*, 11th Conf. on Severe Local Storms, 291–298.

Klemp, J. B., P. S. Ray and R. B. Wilhelmson, 1980: Analysis of merging storms on 20 May 1977. *Preprints*, 19th Conf. on Radar Meteor., 317–324.

Wilhelmson, R. B., 1980: Persistent storms obtained using a three-dimensional numerical storm model. Mini-symposium on Mesoscale Phenomena and Their Interactions held at the Geophysical Fluid Dynamics Laboratory, Princeton, New Jersey, 29.

Wilhelmson, R. B., 1980: Numerical Simulation of Convective Clouds. Collection of Lecture Notes on Dynamics of Mesometeorological Disturbances. CIMMS Symposium, University of Oklahoma, May 12–16, 261–379.

Droegemeier, K. K., and R. B. Wilhelmson, 1982: The roles of thunderstorm outflows in the production and maintenance of convection. *Preprints*, 12th Conf. on Severe Local Storms, 516–519.

Wilhelmson, R. B., and C. S. Chen, 1982: Cell development along cold outflow boundaries. *Preprints*, 12th Conf. on Severe Local Storms, 127–130.

Droegemeier, K. K., and R. B. Wilhelmson, 1983: Three-dimensional numerical simulation of interaction between a shallow cumulus field and a thunderstorm outflow boundary. *Preprints*, 13th Conf. on Severe Local Storms, 245–248.

Rasmussen, E. N., and R. B. Wilhelmson, 1983: Relationships between storm characteristics and 1200 GMT hodographs, low-level shear, and stability. *Preprints*, 13th Conf. on Severe Local Storms, J5–J8.

Ray, P. S., J. B. Klemp, R. B. Wilhelmson and K. W. Johnson, 1983: Testing of multiple-Doppler analysis procedures from the synthesis of simulated radar scans. *Preprints*, 21st Conf. on Radar Meteorology, 547–552.

Wilhelmson, R. B., and J. B. Klemp, 1983: Comparison of Doppler and numerical model data of an Oklahoma squall line. *Preprints*, 21st Conf. on Radar Meteorology, 91–96.

Wilhelmson, R. B., and J. B. Klemp, 1983: Numerical simulation of severe storms within lines. *Preprints*, 13th Conf. on Severe Local Storms, 231–234.

Bradley, Michael M., and Robert B. Wilhelmson, 1984: The effect of mountain wave dynamics on orographic storms. *Preprints*, 3rd AMS Conf. on Mountain Meteorology, 141–143.

Anderson, J. R., K. K. Droegemeier, and R. B. Wilhelmson, 1985: Simulation of the thunderstorm subcloud environment. *Preprints*, 14th Conf. on Severe Local Storms, 147–150.

Droegemeier, K. K., and R. B. Wilhelmson, 1985: Kelvin-Helmholtz instability in a numerically simulated thunderstorm outflow. *Preprints*, 14th Conf. on Severe Local Storms, 151–154.

Wilhelmson, R. B., and J. B. Klemp, 1985: Three-dimensional numerical simulations of the May 19, 1977 Oklahoma squall line. *Preprints*, 14th Conf. on Severe Local Storms, 190–193.

Wilhelmson, R. B., 1987: A Walk into the Future... . Editorial, *The International Journal of Supercomputer Applications*, Vol. 1, No. 2, 3–5.

Wilhelmson, R. B., and publications staff, 1987: Tornadic thunderstorm evolution and structure. *Access*, the bimonthly publication of the National Center for Supercomputing Applications. September–October, Vol. 1.

Wilhelmson, R. B., and publications staff, 1987: The greening of computation science, Supercomputing at the University of Illinois. *Cray Channels*, Cray Research, Inc., Spring, 18–21.

Wilhelmson, R. B., H. E. Brooks, L. J. Wicker, and C. Shaw, 1988: High-resolution numerical simulations of tornadic thunderstorms. *Preprints,* 15th Conf. on Severe Local Storms, Feb. 22–26, Baltimore, Maryland, AMS, J133–J136.

Brooks, H. E., and R. B. Wilhelmson, 1988: Simulations of Oklahoma severe storms on 26 April 1984. *Preprints*, 15th Conf. on Severe Local Storms, Feb. 22–26, Baltimore, Maryland, AMS, J55–J58.

Wilhelmson, R. B., L. J. Wicker, H. E. Brooks, and C. Shaw, 1989: The display of modeled storms. *Preprints*, 5th International Conf. on Interactive and Information Processing Systems for Meteorology, Oceanography, and Hydrology, Jan. 30–Feb. 3, Anaheim, California, AMS, 166–171.

Chin, H.-N. S., and R. B. Wilhelmson, 1989: Modeling of tropical squall and non-squall clusters: Environmental and dynamical differences. *Preprints,* 18th Conf. on Hurricanes and Tropical Meteorology, May 16–19, San Diego, California, AMS, 214–215.

Jewett, B., and R. B. Wilhelmson, 1990: Software for teaching numerical methods for partial differential equations. Preprints, International Conf. on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology, Feb. 4–9, Anaheim, California, AMS, 332–334.

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Searight, K. R., D. P. Wojtowicz, K. P. Bowman, R. B. Wilhelmson, and J. E. Walsh, 1993: ENVISION: A collaborative analysis and display system for large geophysical data sets. *Preprints,* 6th International Conf. on Interactive Information and Processing Systems for Meteorology, Oceanography and Hydrology, AMS, 72–75.

Wilhelmson, R., S. Koch, M. Arrott, J. Hagedorn, G. Mehrotra, C. Shaw, J. Thingvold, B. Jewett, and L. Wicker, 1993: PATHFINDER-Probing ATmospHeric Flows in an INteractive and Distributed EnviRonment. *Preprints,* 6th International Conf. on Interactive Information and Processing Systems for Meteorology, Oceanography, and Hydrology, AMS.

Lee, Bruce D., and R. B. Wilhelmson, 1993: A numerical study of vortex development associated with convergence boundaries. Preprints, 17th Conf. on Severe Local Storms, St. Louis, Missouri, AMS, 366–370.

Muñoz, L. A., and R. B. Wilhelmson, 1993: Structure and evolution of thunderstorms encountering temperature inversions. *Preprints*, 17th Conf. on Severe Local Storms, St. Louis, Missouri, AMS, 247–251.

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Zhou, G., R. B. Wilhelmson and M. K. Ramamurthy, 1993: Nonhydrostatic model simulation of squall line development and structure along a front. *Preprints*, 17th Conf. on Severe Local Storms, St. Louis, Missouri, AMS, 524–528.

Ramamurthy, M. K., R. B. Wilhelmson, S. E. Hall and J. G. Kemp, 1994: Networked multimedia systems and collaborative visualization, 1994. *Preprints*, 3rd Symposium on Education, Nashville, Tennessee, AMS (invited).

Sridhar, M., M. K. Ramamurthy, R. B. Wilhelmson, S. E. Hall, R. Panoff and L. Bievenue, 1994: Increased student participation in collaborative multimedia systems. *Preprints*, 15th National Educational Computing Conference, International Society for Technology in Education (ISTE), Boston, June 13–15, 1994.

Searight, K. R., X. Tao, W. L. Chapman, J. E. Walsh, K. P. Bowman, and R. B. Wilhelmson, 1994: A GCM comparison study using ENVISION. *Preprints*, 10th International Conference on Interactive Information Processing Systems for Meteorology, Oceanography and Hydrology, Nashville, Tennessee, AMS, 372–377.

Zhou, G., and R. B. Wilhelmson, 1994: Analysis of a numerically simulated squall line along a front. *Preprints*, 10th Conference on Numerical Weather Prediction, Portland, Oregon, AMS, 629–631.

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