

**Program for the 9<sup>th</sup> WRF Users' Workshop**  
NCAR Center Green Campus June 23 – 27, 2008

---

**WORKSHOP SYNOPSIS**

**MONDAY – JUNE 23, 2008**

- 11:30 – 13:00 **Pre-Registration**
- 13:00 – 17:00 **Working group Meetings**
- 13:00 – 14:30 Planetary Boundary Layer (*Lead: Wayne Angevine*)
- 14:30 – 16:00 Land-Surface Models (*Lead: Fei Chen*)
- 16:00 – 17:00 Physics (*Lead: John Brown*)
- 13:00 – 15:00 Data Assimilation (*Lead: Dale Barker*)
- 14:00 – 15:30 Verification (*Lead: Chris Davis*)
- 15:00 – 17:00 Regional Climate (*Lead: Ruby Leung*)

**TUESDAY – JUNE 24, 2008**

- 07:30 – 08:30 **Registration** and Coffee
- 08:30 – 10:00 Session 1: WRF Development (1)
- 10:00 – 10:30 Coffee Break
- 10:30 – 12:00 Session 1: WRF Development (2)
- 12:30 – 13:30 *wrfhelp Desk (CG1 Atrium)*
- 13:30 – 15:00 Session 2: Forecasting Systems (1)
- 15:00 – 15:30 Coffee Break
- 15:30 – 16:30 Session 3: Physics Development (1)
- 16:30 – 17:30 General Discussion / Developers' Forum
- 17:30 – 19:00 Workshop Reception

**WEDNESDAY – JUNE 25, 2008**

- 08:00 – 08:30 Coffee
- 08:30 – 10:00 Session 4: WRF Chemistry
- 10:00 – 10:30 Coffee Break
- 10:30 – 12:00 Session 5: WRF Data Assimilation
- 12:30 – 13:30 *wrfhelp Desk (CG1 Atrium)*
- 13:30 – 15:00 Session 6: Regional Climate
- 15:00 – 15:30 General Discussion
- 15:30 – 18:00 Poster Session (with coffee, beer)

**THURSDAY – JUNE 26, 2008**

- 08:30 – 10:00 Session 7: Forecasting Systems (2)
- 10:00 – 10:30 Coffee Break
- 10:30 – 12:00 Session 8: Model Evaluations
- 12:30 – 13:30 *wrfhelp Desk (CG1 Atrium)*
- 13:30 – 15:00 Session 9: Model Applications
- 15:00 – 15:30 Coffee Break
- 15:30 – 16:30 Session 10: WRF Physics Development (2)
- 16:30 – 17:15 General Discussion / Wrap Up

**FRIDAY – JUNE 27, 2008**

- 08:30 – 12:00 **Instruction Sessions**
- 08:30 – 10:00 LEAD Tutorial
- 10:30 – 12:00 MET Tutorial
- 09:00 – 10:30 VAPOR Tutorial

**TUESDAY – JUNE 24, 2008**

**SESSION 1: WRF Development (1)**

**Chair: Joe Klemp** (NCAR)

8:30 – 10:00, Tuesday, June 24

- 1.1** THE WEATHER RESREACH AND FORECASTING MODEL: 2008 ANNUAL UPDATE. *Jimmy Dudhia (NCAR, USA)*
- 1.2** Global WRF. *Bill Skamarock (NCAR)*
- 1.3** IMPLEMENTATION AND TESTING OF WRF DFI. *Steven Peckham, Tanya Smirnova, Stan Benjamin and John Brown (NOAA/ESRL & CU/CIRES, USA), Hans Huang (NCAR), Min Chen (BMB, China), and M. Duda (NCAR)*
- 1.4** VERSION 3 WRF SOFTWARE. *Michalakes, Gill, Duda, Bray (NCAR, USA)*
- 1.5** WRF VERSION 3 PRE- AND POST-PROCESSOR UPDATES. *Duda, Gill, Bresch and Bruyere (NCAR, USA)*

**SESSION 1: WRF Development (2)**

**Chair: Shuyi Chen** (U of Miami)

10:30 – 12:00, Tuesday, June 24

- 1.6** WRF-ARW ANALYSIS NUDGING UPDATE AND FUTURE DEVELOPMENT PLAN. *Aijun Deng, David Stauffer, Jimmy Dudhia, Tanya Otte, Glenn Hunter and Cindy Bruyere (Penn State University and NCAR, USA)*
- 1.7** WRF OBSERVATION-NUDGING UPDATES, VERIFICATION AND FUTURE DEVELOPMENT PLANS. *Yubao Liu, Alfred Bourgeois, Wanli Wu, Wei Yu, Francois Vandenberghe, Mei Xu, Gregory Roux, Jim Dudhia, Josh Hacker, Tom Warner, Scott Swerdlin, Lili Lei, Aijun Deng, and Dave Stauffer (NCAR, USA)*
- 1.8** COUPLED ARW-HYCOM AND APPLICATIONS IN AIR-SEA INTERACTION AND HURRICANE STUDIES. *Jie Ming, Shuyi S. Chen, Wei Zhao, John Michalakes (University of Miami, USA)*
- 1.9** AN UPPER GRAVITY-WAVE ABSORBING LAYER IN WRF FOR NWP APPLICATIONS. *J. B. Klemp, J. Dudhia, and A. D. Hassiotis (NCAR, USA)*
- 1.10** THE MODEL EVALUATION TOOLS (MET): NEW CAPABILITIES AND PLANS FOR FUTURE ENHANCEMENTS. *Barbara Brown, Lacey Holland, John Halley Gotway, Eric Gilleland, and Randy Bullock (NCAR, USA)*
- 1.11** A PUBLIC RELEASE OF WRF PORTAL. *Jeff Smith and Mark Govett (CIRA, USA)*

**WRFhelp Desk** (*please sign-up at the registration desk*)

12:30 – 1:30 (CG1 Atrium)

**SESSION 2: Forecasting Systems (1)**

**Chair: Cliff Mass (UW)**

1:30 – 3:00, Tuesday, June 24

- 2.1** UPDATE ON WRF IN NCEP OPERATIONS. *Geoff DiMego, Zavisla Janjic, Tom Black, Eric Rogers, Brad Ferrier, Matt Pyle, Dusan Jovic, Jun Du (NOAA / NWS / NCEP, USA)*
- 2.2** A COMPREHENSIVE REAL-TIME EVALUATION OF WRF OVER THE PACIFIC NORTHWEST. *Cliff Mass, David Ovens, Phil Regulski, and Jeff Baars (University of Washington, US)*
- 2.3** ADVANCEMENT OF THE HWRF FOR NEXT GENERATION HURRICANE PREDICTION AT NCEP'S ENVIRONMENTAL MODEL CENTER. *Naomi Surgi, Robert E. Tuleya, Qingfu-Lui, Vijay Tallapragada, Young Kwon (Environmental Modeling Center/NCEP/NWS/NOAA, USA)*
- 2.4** PROGRESS TOWARD WRF APPLICATIONS IN 13KM RAPID REFRESH AND ITS 3-KM NEST, THE HIGH RESOLUTION RAPID REFRESH. *Weygandt, Stephen, T. Smirnova, J. M. Brown, S. Benjamin, G. Grell, S. Peckham, D. Devenyi, M. Hu, K. Brundage, and T. L. Smith (NOAA/Earth System Research Lab, USA)*
- 2.5** COMMERCIAL IMPLEMENTATION OF WRF WITH EFFICIENT COMPUTING AND ADVANCED DATA ASSIMILATION. *B. L. Shaw, R. L. Carpenter Jr., P. L. Spencer, Z. Dufran (Weather Decision Technologies, Inc., USA)*
- 2.6** WRF REFERENCE CONFIGURATIONS – CONCEPT AND PLANS. *Jamie Wolff, Beth Weekley, and Louisa Nance (NCAR, USA), Ligia Bernardet (NOAA, USA), and Barbara Brown (NCAR, USA)*

**SESSION 3: Physics Development (1)**

**Chair: John Brown (NOAA)**

3:30 - 4:30, Tuesday, June 24

- 3.1** RELEASE OF UNIFIED NOAH LAND SURFACE MODEL IN WRF3.0 AND PLAN FOR FUTURE ENHANCEMENTS. *Mukul Tewari, Mike Ek, Fei Chen, Jimmy Dudhia, Anil Kumar, Ken Mitchell, Guo-Yue Niu, Zong-Liang Yang, Dev Niyogi, Xubin Zeng, John Eylander (NCAR, USA)*
- 3.2** A TOTAL ENERGY / MASS FLUX PBL SCHEME FOR WRF. *W.M. Angevine, T. Mauritsen (CIRES / NOAA ESRL, USA)*
- 3.3** STABLE BOUNDARY LAYER MIXING IN A VERTICAL DIFFUSION SCHEME. *Song-You Hong (Yonsei University, Korea), and Si-wan Kim (NOAA, USA)*
- 3.4** AN INDIRECT DATA ASSIMILATION SCHEME FOR DEEP SOIL TEMPERATURE IN THE PLEIM-XIU LAND SURFACE MODEL. *Jonathan E. Pleim, and Robert Gilliam (USEPA, USA)*

**General Discussion / Developers' Forum**

4:30 – 5:30, Tuesday, June 24

**Workshop Reception** (5:30 – 7:00, Tuesday, June 24)

**WEDNESDAY – JUNE 25, 2008**

**SESSION 4: WRF Chemistry**

**Chair: George Grell (NOAA)**

8:30 – 10:00, Wednesday, June 25

- 4.1** VERSION 3 OF WRF-CHEM: NEW IMPLEMENTATIONS AND EVALUATIONS. *Georg Grell, Jerome Fast, William Gustafson jr., Saulo Freitas, Rainer Schmitz, Thomas Diehl, Steven Peckham (NOAA/ESRL/CIRES, USA)*
- 4.2** COMPARISON OF WRF/CHEM PHOTOCHEMISTRY AND PM2.5 AEROSOL RESULTS WITH AIRCRAFT OBSERVATIONS FROM TWO INTENSIVE FIELD CAMPAIGNS. *Stuart McKeen, Georg Grell, Steven Peckham and Si-Wan Kim (NOAA/CIRES, USA)*
- 4.3** REGIONAL MODELING OF PARTICULATE CHEMISTRY AND ITS EFFECT ON CLOUD-AEROSOL INTERACTIONS OVER THE SOUTHEASTERN PACIFIC OCEAN. *Jerome Fast, Weiguo Wang, and Elaine Chapman (Pacific Northwest National Laboratory, USA)*
- 4.4** TEST OF REVISED YSU PLANETARY BOUNDARY LAYER MODEL WITHIN WRF-CHEM MODEL. *S.-W. Kim, S.-Y. Hong, and S. A. McKeen (CIRES and NOAA/ESRL, USA)*
- 4.5** TOWARD REGIONAL FOSSIL FUEL CO2 EMISSIONS VERIFICATION USING WRF-CHEM. *Branko Kosovic, Luca Delle Monache, Philip Cameron-Smith, Dan Bergmann, Keith Grant, Tom Guilderson (Lawrence Livermore National Laboratory, USA)*
- 4.6** DOES AN ONLINE APPROACH IMPROVE THE MODELING OF REGIONAL AIR QUALITY IN THE UK? *Charles Chemel (University of Hertfordshire, UK)*

**SESSION 5: WRF Data Assimilation**

**Chair: Dale Barker (UK Met)**

10:30 – 12:00, Wednesday, June 25

- 5.1** TOWARD A UNIFIED WRF DATA ASSIMILATION SYSTEM: WRFDA. *X.-Y. Huang, D. Barker, Z. Liu, X. Zhang, Y. Chen, Q. Xiao, T. Auligne, H. Shao, Y.-R Guo, M. Demirtas, S. Rizvi, H.-C. Lin, M. Duda, H. Wang, Z. Ma, S. Thomas, W. Huang, J. Sun, C. Snyder, Y.-H. Kuo and S. Rugg (NCAR, USA)*
- 5.2** PERFORMANCE OF WRF 4D-VAR SYSTEM: SCIENTIFIC AND SOFTWARE ENGINEERING. *Xin Zhang, X.-Y. Huang and H. L. Wang (NCAR, USA)*
- 5.3** IMPACT OF AIRS OBSERVATIONS OVER THE ANTARCTIC REGION. *Thomas Auligne, Hui Shao, Dale Barker, Zhiquan Liu and Hui-Chuan Lin (NCAR, USA)*
- 5.4** ASSIMILATION OF RADAR RADIAL VELOCITY AND REFLECTIVITY MEASUREMENTS WITH A HYBRID DATA ASSIMILATION APPROACH BUILT UPON WRF-3DVAR AND "NUDGING-BASED" FDDA. *Wei Yu, Yubao Liu, Tom Warner, Qingnong Xiao and Jenny Sun (NCAR/RAL, USA)*

- 5.5** CHEMICAL DATA ASSIMILATION OF OZONE AND FINE AEROSOLS. INITIAL RESULTS USING THE NMM-WRF/CHEM AND THE GRIDPOINT STATISTICAL INTERPOLATION (GSI) ANALYSIS SYSTEM. *Mariusz Pagowski, Georg A. Grell, Steven E. Peckham, Stuart McKeen, and Dezso Devenyi (NOAA/ESRL, USA)*
- 5.6** APPLICATIONS OF WRF DATA ASSIMILATION SYSTEM AT THE NCAR DATA ASSIMILATION TESTBED CENTER. *Hans Huang, Hui Shao, Meral Demirtas, Zhiquan Liu, Rizvi Syed, Thomas Auligne and Dale Barker (NCAR, USA)*

**WRFhelp Desk** (*please sign-up at the registration desk*)  
12:30 – 1:30 (CG1 Atrium)

**SESSION 6: Regional Climate**

**Chair: Ruby Leung (PNNL)**

1:30 – 3:00, Wednesday, June 25

- 6.1** PREDICTING THE EARTH SYSTEM ACROSS SCALES: THE NRCM APPROACH. *J. Hurrell (NCAR)*
- 6.2** TROPICAL RAIN-RATE SPECTRAL STRUCTURES, MODELED AND OBSERVED. *Hsiao-ming Hsu and Joseph J. Tribbia (NCAR/ESSL, USA)*
- 6.3** POLAR WRF. *Keith M. Hines, David H. Bromwich, and Le-Sheng Bai (The Ohio State University, USA)*
- 6.4** ANALYSIS OF THE NARCCAP WRF SIMULATIONS OF COLD SEASON EXTREME PRECIPITATION. *Ruby Leung, and Yun Qian (PNL, USA)*
- 6.5** INDIAN SUMMER MONSOON SIMULATION OF 2002 – 2003 USING WRF-ROMS COUPLED SYSTEM. *Sudipta Banerjee, Mohit Dalvi, J. Venkata. Ratnam, K. Krishnakumar and Amit P. Kesarkar (Centre for Development of Advanced Computing, India)*
- 6.6** EFFECTS OF SOOT-INDUCED SNOW ALBEDO CHANGE ON SNOWPACK AND HYDROLOGICAL CYCLE IN WESTERN U.S. BASED ON WRF CHEMISTRY AND REGIONAL CLIMATE SIMULATIONS. *Yun Qian, William I. Gustafson Jr., L. Ruby Leung, Steven J. Ghan (Pacific Northwest National Laboratory, USA)*

**General Discussion**

3:00 – 3:30, Wednesday, June 25

**POSTER SESSION**

3:30 – 6:00, Wednesday, June 25

**THURSDAY – JUNE 26, 2008**

**SESSION 7: Forecasting Systems (2)**

**Chair: Dave Stensrud (NOAA)**

8:30 – 10:00, Thursday, June 26

- 7.1** JOINT ENSEMBLE FORECAST SYSTEM (JEFS) PROJECT UPDATE. *Jeffrey Cunningham, Timothy Nobis, Evan Kuchera, Scott Rentschler, Steve Rugg, & Matthew Sittel (HQ Air force Weather Agency (AFWA), USA)*
- 7.2** BUILDING ENSEMBLES BY VARYING PARAMETERS: AN EXPLORATION OF PARAMETER RANGES. *Joshua Hacker, Chris Snyder, Matt Pocerlich, Soyoungh Ha, Jimmy Dudhia, Julie Schramm (NCAR, USA)*
- 7.3** REAL-TIME STORM-SCALE ENSEMBLE FORECAST EXPERIMENT. *Fanyou Kong, Ming Xue, Kelvin Droegemeier, Kevin Thomas, Yunheng Wang (University of Oklahoma, USA)*
- 7.4** PERFORMANCE AND CALIBRATION OF A SHORT-RANGE ENSEMBLE PREDICTION SYSTEM OVER EUROPE. *D. Santos-Mu–Oz, A. Callado, Jose A. Garcia-Moya, C. Santos, J. Simarro (AEMET, Spain)*
- 7.5** APPLICATIONS OF WRF IN ICELAND. *Ólafur Rögnvaldsson, Jian-Wen Bao and Hálfdrán Ágústsson (Institute for Meteorological Research, Iceland)*
- 7.6** LINKED ENVIRONMENTS FOR ATMOSPHERIC DISCOVERY (LEAD): A WEB SERVICES ENVIRONMENT FOR DATA ACQUISITION, ASSIMILATION AND MODELING. *Kelvin K. Droegemeier and Collaborators (University of Oklahoma, USA)*

**SESSION 8: Model Evaluations**

**Chair: Chris Davis (NCAR)**

10:30 – 12:00, Thursday, June 26

- 8.1** WRF AND MM5 REALTIME SYSTEM STATISTICAL COMPARISONS USING THE MODEL EVALUATION TOOLKIT (MET). *Jeffrey R. Zielonka, Brian J. Gaudet, Nelson L. Seaman, David R. Stauffer, Aijun Deng, and Glenn K. Hunter (Penn State University, USA)*
- 8.2** THE USE OF WRF-3DVAR FOR 36 H REALTIME EXPLICIT (3 KM) CONVECTIVE FORECASTS WITH WRF-ARW. *Morris Weisman, Wei Wang, Zhiquan Liu (NCAR, USA)*
- 8.3** ANNUAL EVALUATION OF WRF-ARW AND WRF-NMM METEOROLOGICAL SIMULATIONS OVER EUROPE. *O. Jorba, P. Jiménez-Guerrero, J.M. Baldasano (Barcelona Supercomputing Center, Spain)*
- 8.4** IS THE WRF BETTER THAN THE GFS? *Barry Lynn, Asher Meir, and Yaakov Consor (Weather It Is, LTD, Israel)*
- 8.5** POSITIVE DEFINITE MOISTURE ADVECTION IN OROGRAPHY. *Robert Hahn & Clifford Mass (University of Washington, USA)*

- 8.6** TROPICAL CYCLONE FORECAST TRACK AND INTENSITY SENSITIVITIES TO VARIOUS PARAMETERIZATIONS USING THE WRF-ARW MODEL. *Nick P. Bassill and Michael C. Morgan (University of Wisconsin-Madison, USA)*

**WRFhelp Desk** (*please sign-up at the registration desk*)  
12:30 – 1:30 (CG1 Atrium)

**SESSION 9: Model Applications**

**Chair: Nelson Seaman (PSU)**

1:30 – 3:00, Thursday, June 26

- 9.1** FROM CONCENTRIC EYEWALL TO ANNULAR HURRICANE. *Xiaqiong Zhou (University of Hawaii, USA)*
- 9.2** LARGE EDDY SIMULATIONS OF AN IDEALIZED HURRICANE. *Yongsheng Chen, R. Rotunno, W. Wang, C. Davis, J. Dudhia, G. Holland (NCAR, USA)*
- 9.3** VERTICALLY NESTED NONHYDROSTATIC MODEL FOR MULTI-SCALE RESOLUTION OF FLOWS IN THE UPPER TROPOSPHERE AND LOWER STRATOSPHERE. *M. Moustouai and A. Mahalov (Arizona State University, USA)*
- 9.4** SIMULATING ATMOSPHERE FLOW FOR WIND ENERGY APPLICATIONS WITH WRF-LES. *J.K. Lundquist, J. D. Mirocha, F. K. Chow, Branko Kosović, K. A. Lundquist (Lawrence Livermore National Lab, USA)*
- 9.5** NUMERICAL PREDICTION OF MESOGAMMA SCALE WIND MEANDERING IN THE NOCTURNAL STABLE BOUNDARY LAYER. *Nelson L. Seaman, Brian J. Gaudet, John C. Wyngaard, Larry Mahrt, Scott Richardson and David R. Stauffer (Penn State University, USA)*
- 9.6** EVALUATION OF POSITIVE-DEFINITE AND MONOTONIC LIMITERS FOR SCALAR ADVECTION IN THE ADVANCED RESEARCH WRF. *Hailong Wang (University of Colorado & NOAA, USA), William C. Skamarock (NCAR, USA), and Graham Feingold (NOAA, USA)*

**SESSION 10: WRF Physics Development (2)**

**Chair: John Brown (NOAA)**

3:30 – 4:30, Thursday, June 26

- 10.1** IMPROVING WRFs LARGE-EDDY SIMULATION CAPABILITY WITH NEW SUBFILTER STRESS MODELS. *J.D. Mirocha (Lawrence Livermore National Laboratory, USA), F. K. Chow (University of California at Berkeley, USA), J. K. Lundquist, and B. Kosović Lundquist (Lawrence Livermore National Laboratory, USA) and K.A. Lundquist (Lawrence Livermore National Laboratory & University of California at Berkeley, USA)*
- 10.2** DEVELOPMENT OF A NEW VERSION OF THE GD CONVECTIVE PARAMETERIZATION. *Georg Grell NOAA/ESRL/CIRES, USA)*

- 10.3** DEVELOPMENT OF A NEW BULK MICROPHYSICAL SCHEME FOR WRF WITH VARYING SNOW CHARACTERISTICS AND RIMING INTENSITY. *Yanluan Lin and Brian A. Colle (Stony Brook University, USA)*
  
- 10.4** DEVELOPMENT AND SENSITIVITY TEST OF A NEW WRF BIN MICROPHYSICS SCHEME. *Lulin Xue (Saint Louis University, USA), Amit Teller, Changhai Liu, and Roy Rasmussen (NCAR, USA), and Zaitao Pan (Saint Louis University, USA)*

**General Discussion / Wrap Up**

4:30 – 5:00, Thursday, June 26

**POSTER SESSION**

3:30 – 6:00 Wednesday, June 25

**Physics Development**

- P3.1** THE GABLS3 SINGLE-COLUMN MODEL INTERCOMPARISON: WRF RESULTS. *W.M. Angevine (CIRES / NOAA ESRL, USA)*
  
- P3.2** COUPLING A HIGH-RESOLUTION DYNAMIC ECOHYDROLOGICAL MODEL (TRIBS-VEGGIE) AND WEATHER RESEARCH AND FORECASTING (WRF) MODEL. *Bisht, G., Narayan, U., Bras, R. L., Ivanov, V. I., and Vivoni, E. R. (Massachusetts Institute of Technology, USA)*
  
- P3.3** THE RAMS CLOUD MICROPHYSICS PARAMETERIZATION IN WRF-ARW: COMPARISON AGAINST THE THOMPSON AND MORRISON CLOUD SCHEMES. *Laura Fowler, Greg Thompson, and Hugh Morrison (Cooperative Institute for Research in the Atmosphere, USA)*
  
- P3.4** SENSITIVITY STUDY OF CLOUD-RESOLVING CONVECTIVE SIMULATIONS WITH WRF USING THE PLIN AND WSM6 MICROPHYSICAL PARAMETERIZATIONS. *Song-You Hong, Kyo-Sun Lim, Ju-Hye Kim, and Jeong-Ock Jade Lim (Yonsei University, Korea), and Jimmy Dudhia (NCAR, USA)*
  
- P3.5** A NEW UNIFIED MIXED-PHASE PARTICLE FALL SPEED IN BULK MICROPHYSICS PARAMETERIZATIONS. *Jimmy Dudhia (NCAR, USA), and Song-You Hong and Kyo-Sun Lim (Yonsei University, Korea)*
  
- P3.6** A NEW DOUBLE MOMENT APPROACH FOR THE WARM-RAIN PROCESS BASED ON THE WSM6 SCHEME (WDM6). *Kyo-Sun Lim and Song-You Hong (Yonsei University, Korea)*
  
- P3.7** INTRODUCTION OF WRF INTO COUPLED WATER CYCLE MODEL. *Haruyasu Nagai, Katsunori Tsuduki, And Takuya Kobayashi (Japan Atomic Energy Agency, Japan)*
  
- P3.8** A QNSE-BASED SURFACE LAYER PARAMETERIZATION. *S. Sukoriansky, B. Galperin and E. Atlaskin (Ben-Gurion University of the Negev, Israel)*

- P3.9** COUPLED ARW-OCEAN MODELING OF TROPICAL CYCLONES. *Chiaying Lee and Shuyi S. Chen (University of Miami, USA)*
- P3.10** TESTING OF THE GODDARD CLOUD MICROPHYSICS SCHEME WITH THE WEATHER RESEARCH AND FORECASTING MODEL IN A SNOW STORM UP IN ONTARIO, CANADA. *Jainn J. Shi, Toshihisa Matsui, Wei-Kuo Tao, Arthur Hou, Stephen Lang, Robert Cifelli, C. Peters-Lidard, Gail Jackson, Steve Rutledge, Walter Petersen (Goddard Earth Sciences and Technology Center, USA)*
- P3.11** MODIFIED MELLOR-YAMADA-JANJIC SURFACE/BOUNDARY LAYER PARAMETERIZATION FOR NEAR-SURFACE WIND CONDITIONS. *Kay Suselj, Abha Sood (Carl von Ossietzky University Oldenburg, Germany)*
- P3.12** EVALUATION OF A BULK MICROPHYSICAL SCHEME USING TWO COOL SEASONS OF HIGH RESOLUTION SIMULATIONS. *Yanluan Lin, Brian A. Colle, and Sandra E. Yuter (Stony Brook University-SUNY, USA)*

#### **WRF Chemistry**

- P4.1** OFF-LINE LINKAGE OF AN AIR QUALITY MODEL TO WRF/NMM & WRF/ARW. *D.W. Byun, F. Ngan, and P. Percell (University of Houston, USA)*
- P4.2** DEVELOPING NEW CHEMICAL MECHANISMS FOR WRF. *William R. Stockwell, Wendy S. Goliff, Askar Fahr, Tatiana Gonzalez, Rosa M. Fitzgerald, Duanjun Lu (Howard University, USA)*
- P4.3** DEVELOPMENT OF NMMB-AQ: CURRENT STATUS. *Youhua Tang (Scientific Applications International Corporation, USA), Jeffery T. McQueen, and Thomas L. Black (NOAA, USA), Zavis Janjic (UCAR, USA), Mark D. Iredell, and Paula M. Davidson (NOAA, USA)*
- P4.4** USING GLOBAL WRF/CHEM TO STUDY CLIMATE-CHEMISTRY INTERACTIONS. *Xinyu Wen, Xiao-Ming Hu, Ying Pan, Yang Zhang, William C. Skamarock, Francis Vitt, Prakash Karamchandani, and Georg A. Grell (NC State University, USA)*
- P4.5** UPDATES ON THE DEVELOPMENT AND APPLICATION OF WRF/CHEM-MADRID. *Yang Zhang, Xiao-Ming Hu, Ying Pan, Xin-Yu Wen, Yao-Sheng Chen, Jerome D. Fast, Georg A. Grell, Steven E. Peckham, Kenneth L. Schere, and Carey J. Jang (North Carolina State University, USA)*
- P4.6** THE ROLE OF ADVECTION SCHEME AND CHEMICAL MECHANISMS ON THE WRF-CHEM SIMULATION OF NITROGEN DIOXIDE COLUMN DENSITY. *G. J. Frost, S.-W. Kim, S. A. McKeen, E.-Y. Hsie, and M. K. Trainer (NOAA, USA)*
- P4.7** USING WRF FOR PARAMETERIZATION DEVELOPMENT: THE MAKING OF ECPP FOR MMF MODELS. *Williams I. Gustafson Jr., Richard C. Easter, Larry K. Berg, and Steven J. Ghan (Pacific Northwest National Laboratory, Richland, USA)*

- P4.8** APPLICATION OF WRF/CHEM-MADRID WITH UPDATED EMISSIONS TO THE JULY 2004 NEW ENGLAND AIR QUALITY STUDY EPISODE. *Xiao-Ming Hu, Yang Zhang, Shaocai Yu, Kenneth L. Schere, Stuart A. McKeen, Georg A. Grell, and Steven E. Peckham (North Carolina State University, USA)*
- P4.9** SENSITIVITY OF THE WRF-CHEM SIMULATIONS TO THE UNCERTAINTIES IN THE LARGE-SCALE ANALYSIS AND THE SOIL INITIALIZATION. *E. D. Grell, J.-W. Bao, S. A. Michelson, G. A. Grell (NOAA/ESRL, USA)*
- P4.10** COMPARISON OF ONLINE AND OFFLINE MODELING WITH WRF/CHEM. *Julius S. Chang, Hsu Wei Hsu, Tsun Hsien Liu, Tufu Chen, Chi Kang Chiang, and Jing Li (National Central University, Taiwan)*
- P4.11** UPDATE ON THE DEVELOPMENT OF THE AEROSOL MODELING TESTBED. *Jerome Fast, William Gustafson Jr., Elaine Chapman, Jeremy Rishel, and Douglas Baxter (Pacific Northwest National Laboratory, USA), Georg Grell (NOAA, USA), and Mary Barth (NCAR, USA)*
- P4.12** SENSITIVITY OF WRF-CHEM SIMULATIONS TO THE UNCERTAINTIES IN THE LARGE-SCALE ANALYSIS AND THE SOIL INITIALIZATION. *E.D.Grell, J.-W. Bao, S.A. Michelson and G.A. Grell (CIRES/NOAA, USA)*
- P4.13** IMPLEMENTATION OF THE CB05 CHEMICAL MECHANISM INTO WRF/CHEM. *Jerold Herwehe, Ying Pan, and Yang Zhang (NOAA/OAR/ARL/Atmospheric Sciences Modeling Division, USA)*
- P4.14** *Withdrawn*
- P4.15** A FAST NUMERICAL SOLVER FOR CHEMISTRY SUBMODELS IN WRF/CHEM. *Jing Li (National Central University, Taiwan)*
- P4.16** WRF-CHEM MODELING STUDY FOR THE WASHINGTON, DC AND BALTIMORE, MD METROPOLITAN AREAS. *Christopher P. Loughner, Dale J. Allen, and Elena Yegorova (University of Maryland, College Park, USA)*
- P4.17** A GIS EMISSIONS PRE-PROCESSOR (GEM-PP) TO INGEST CORINAIR EMISSION. *Gian Paolo Marra, Dario Conte, Cristina Mangia, Umberto Rizza (CNR-ISAC, Italia)*
- P4.18** PROJECTION OF SURFACE OZONE OVER EAST ASIA IN 2020. *Masayuki Takigawa, Masanori Niwano, and Hajime Akimoto (Frontier Research Center for Global Change, Japan), Masaaki Takahashi (Frontier Research Center for Global Change & University of Tokyo, Japan), and Kazuhiko Kobayashi (University of Tokyo, Japan)*
- P4.19** WRF-CHEM SIMULATIONS OF MID-ATLANTIC AIR QUALITY. *Elena Yegorova, Dale Allen, and Christopher Loughner (University of Maryland, USA) and Ken Pickering (Goddard Space Flight Center, NASA, USA)*

- P4.20** COMPARISON OF MODEL SIMULATED AEROSOL VERTICAL PROFILE WITH SATELLITE OBSERVATIONS. *Qian Tan, Mian Chin, and Hongbin Yu, UMBC/GEST (UMBC, USA)*
- P4.21** APPLICATION OF THE WRF-CHEM MODEL IN THE ANALYSIS OF OROGRAPHIC VENTING OF ATMOSPHERIC BOUNDARY LAYER AIR IN CALIFORNIA'S CENTRAL VALLEY. *J.-W. Bao, S.A. Michelson, E.D. Grell, G.A. Grell (NOAA/ESRL, USA)*
- P4.22** IMPLEMENTATION AND PRELIMINARY TESTS OF AN AIR QUALITY FORECASTING SYSTEM BASED ON WRF-CHEM OVER MIDDLE-EAST, ARABIAN PENINSULA AND UNITED ARAB EMIRATES. *Ajjaji Radi (United Nations Development Programme, UAE), Ahmad Awad Al-Katheri and Abdullah Dhanhani (Air Force & Air Defense, UAE)*
- P4.23** A COMPARISON OF AIR QUALITY SIMULATION USING MM5 AND WRF FOR 2004 SUMMER HIGH OZONE EPISODE IN KOREA. *Nankyong Moon, & Kangyeol Lee (Korea Environment Institute, Korea), & Soontae Kim (University of Houston)*

#### **WRF Data Assimilation**

- P5.1** RADIANCE DATA ASSIMILATION FOR WRF MODEL: OVERVIEW AND RESULTS. *Zhiquan Liu, Tom Auligne, Hui-Chuan Lin, Dale Bark, Xiaoyan Zhang, Xin Zhang and Hui Shao (NCAR, USA)*
- P5.2** THE IMPACT OF ASSIMILATING ATMOSPHERIC INFRARED SOUNDER DATA ON THE NUMERICAL SIMULATION OF HURRICANE DENNIS. *Zhaoxia Pu (University of Utah, USA)*
- P5.3** IMPACT OF OUTER LOOP FOR WRF DATA ASSIMILATION SYSTEM (WRFDA). *Syed Rizvi, Y.-R Guo, H. Shao, M. Demirtas and X.-Y. Huang (NCAR, USA)*
- P5.4** IMPACT STUDIES OF SATELLITE OBSERVATIONS IN THE ANTARCTIC MESOSCALE PREDICTION SYSTEM: AMSU-A RADIANCE MEASUREMENTS. *Hui Shao, Zhiquan Liu, Thomas Auligne, Dale Barker, Jordan Powers and Xiang-Yu Huang (NCAR, USA)*
- P5.5** DOPPLER RADAR DATA ASSIMILATION WITH WRF 3D-VAR: IHOP RETROSPECTIVE STUDIES. *Qingnong Xiao, Eunha Lim, Xiaoyan Zhang, Juanzhen Sun and Zhiquan Liu (NCAR, USA)*
- P5.6** ASSIMILATION OF DOPPLER RADAR DATA WITH WRF 4DVAR FOR A CONVECTIVE CASE. *Yong-Run Guo and Juanzhen Sun (NCAR, USA)*
- P5.7** IMPACT OF THE GSI DATA ASSIMILATION ON WRF- NMM FORECAST OF TROPICAL CYCLONES OVER NORTH INDIAN OCEAN. *K. Naga Ratna (India Meteorological Department, India), Ming Hu (NOAA, USA), Xiang-Yu Huang, and S.R.Rizvi (NCAR, USA) and S. Pattnayak (ITT, India)*

- P5.8** ASSIMILATION AND SIMULATION OF CYCLONE GONU (2007) USING THE UAE WRFVAR SYSTEM. *Ahmad Awad Al-Katheri (Air Force & Air Defense, UAE), Ajjaji Radi, and Abdullah Dhanhani (United Nations Development Programme, UAE)*
- P5.9** AN IMPACT STUDY OF FORMOSAT-3/COSMIC GPS RADIO OCCULTATION AND DROPSONDE DATA ON WRF SIMULATIONS. *Fang-Ching Chien (National Taiwan Normal University, Taiwan), and Ying-Hwa Kuo (NCAR, USA)*
- P5.10** ASSIMILATION EXPERIMENTS WITH COSMIC GPS RADIO OCCULTATION MEASUREMENTS AND GROUND-BASED GPS PWV: TYPHOON "NARI" IN 2007. *Jaewon Lee, Jungho Cho, Jeongho Baek, and Jong-Uk Park (Korea Astronomy and Space Science Institute, South Korea)*
- P5.11** ASSIMILATION OF AMSU-A RADIANCE FOR IMPROVING KATRINA FORECAST. *Dongliang Wang and Zhiquan Liu (NCAR, USA)*
- P5.12** AN OBSERVING SYSTEM SIMULATION EXPERIMENT FOR METEOSAT THIRD GENERATION INFRA-RED SOUNDING RETRIEVALS USING BOTH MM5 AND WRF. *Xiang-Yu Huang, Hongli Wang, Yongsheng Chen, and Xin Zhang (NCAR, USA), Stephen A. Tjemkes, and Rolf Stuhlmann (EUMETSAT)*
- P5.13** AN ENSEMBLE-BASED FOUR-DIMENSIONAL VARIATIONAL DATA ASSIMILATION SCHEME. *Chengsi Liu (LASG and NCAR, USA), Qingnong Xiao (NCAR, USA) and Bin Wang (LASG)*
- P5.14** ASSIMILATION OF ATMOSPHERIC INFRARED SOUNDER (AIRS) PROFILES USING WRF-VAR. *Shih-Hung Chou (NASA, USA), Bradley Zavodsky (University of Alabama, USA), Gary Jedlovec, and William Lapenta (NASA, USA)*
- P5.15** HIGH-RESOLUTION SHORT-RANGE NWP OF HIGH-IMPACT WEATHER EVENTS ON THE KOREAN PENINSULA. *Meral Demirtas, Dale Barker, Jimmy Dudhia, and Dave Gill (NCAR, USA), Ji-Hyun Ha (SNU, S. Korea), Seung-On Hwang (KMA, S. Korea) and Eunha Lim (NCAR, USA)*

### **Regional Climate**

- P6.1** EVALUATION OF A WRF DYNAMICAL DOWNSCALING SIMULATION OVER CALIFORNIA. *Peter Caldwell, Hung-Neng S. Chin, David C. Bader, and Govindasamy Bala (Lawrence Livermore National Lab, USA)*
- P6.2** A PARAMETRIC STUDY OF WRF PHYSICS FOR THE REGIONAL CLIMATE APPLICATION OVER CALIFORNIA *Hung-Neng S. Chin, Peter M. Caldwell, and David C. Bader (Lawrence Livermore National Lab, USA)*
- P6.3** CWRF PBL SCHEMES FOR CLIMATE APPLICATION: VALIDATION AGAINST FIELD CAMPAIGNS. *Xin-Zhong Liang, Shuyan Liu, Everette Joseph, and Vernon R. Morris (University of Illinois at Urbana-Champaign, USA)*

- P6.4** EVALUATION OF LONG DURATION WRF SIMULATIONS IN THE ARCTIC. *Mark W. Seefeldt and John J. Cassano (University of Colorado at Boulder, USA)*
- P6.5** IMPROVING SYSTEMATIC ERRORS IN A REGIONAL CLIMATE MODEL FOR THE UNITED STATES PACIFIC NORTHWEST. *Richard C. Steed, Clifford F. Mass, and Eric P. Salathé (University of Washington, USA)*
- P6.6** SENSITIVITY OF WRF REGIONAL CLIMATE SIMULATIONS TO LATERAL AND SURFACE BOUNDARY CONDITIONS. *WJ Capehart, EA Liske, and KM Carroll (South Dakota School of Mines and Technology, USA)*
- P6.7** A MULTI-YEAR ARCTIC SYSTEM REANALYSIS. *David. H. Bromwich, Dale M. Barker, John E. Walsh, Mark C. Serreze, Ying-Hwa Kuo, Fei Chen, Keith M. Hines, Le-Sheng Bai, Sheng-Hung Wang, Andrew G. Slater, William L. Chapman, Hans Huang, Michael Barlage, Tae-Kwon Wee, Paul R. Berger, and Lin Li (The Ohio State University, USA)*
- P6.8** AN EARLY EOCENE CLIMATE STUDY: INITIALIZING WRF WITH CAM OUTPUT UTILIZING MODIFIED WPS PROCEDURES. *Ripley McCoy, Paul Nutter, Cindy Shellito (University of Northern Colorado, USA)*
- P6.9** TROPICAL CYCLONE CLIMATOLOGY AND INTER-ANNUAL VARIABILITIES SIMULATED BY WRF-NRCM. *Asuka Suzuki-Parker and Greg Holland (NCAR, USA)*

#### **Model Evaluations**

- P8.1** VERIFICATION OF WRF-PREDICTED MESOGAMMA-SCALE SPECTRA IN THE SBL USING A HIGH-FREQUENCY FILTER DECOMPOSITION. *Brian J. Gaudet, Nelson L. Seaman, David R. Stauffer, Scott Richardson, Larry Mahrt, John C. Wyngaard (Penn State University, USA)*
- P8.2** DEFINITIONS OF DETERMINISM. *Brian J. Gaudet (Penn State University, USA)*
- P8.3** INVESTIGATING THE EFFECTS OF HIGH-RESOLUTION SSTs OF LARGE LAKES AND COASTAL AREAS ON THE LOW-LEVEL CIRCULATION. *Andrea Hahmann, Yubao Liu, Jason Knievel, and Daran Rife (NCAR, USA)*
- P8.4** A COMPARATIVE STUDY ON PERFORMANCE OF MM5 AND WRF (ARW & NMM) MODELS IN SIMULATION OF TROPICAL CYCLONE OVER BAY OF BENGAL. *S. Pattanayak and U. C. Mohanty (ITT, India), S. R. Rizvi, and X. Huang (NCAR, USA) and K. Naga Ratna (India Meteorological Department, India)*
- P8.5** AN EVALUATION OF THE WRF MODEL AS A TOOL TO PRODUCE WIND FORECASTS AND CLIMATE STATISTICS FOR ALBERTA, CANADA. *Kenneth T. Waight, Glenn E. Van Knowe, Steve Young, and John W. Zack (MESO, Inc., USA)*

- P8.6** EVALUATION OF UNITED ARAB EMIRATES WRF TWO-WAY NESTED MODEL ON A SET OF THICK COASTAL FOG SITUATIONS. *Ajjaji Radi (United Nations Development Programme, UAE), Ahmad Awad Al-Katheeri and Khaled Al-Chergui (Air Force & Air Defense, UAE)*
- P8.7** OBJECTIVE VERIFICATION RESULTS FROM FORECASTS GENERATED WITH THE ARW AND NMM DYNAMIC CORES OF THE WRF MODEL. *Lìgia Bernardet (NOAA, USA), Jamie Wolff, Louisa Nance, and Eric Gilleland (NCAR, USA), Betsy Weatherhead, Christopher Harrop, Mark Govett, and Andrew Loughie (NOAA, USA)*
- P8.8** WRF MODEL PREDICTION OF BAY OF BENGAL CYCLONE SIDR. *Sahidul Islam Kaginalkar (Center for Development of Advanced Computing, India), R. Ashrit (National Center for Medium Range Weather Forecasting, India), Saurabh Bhardwaj and Akshara Kaginalkar (Center for Development of Advanced Computing, India)*
- P8.9** CLOUD MICROPHYSICS IMPACT ON HURRICANE TRACK AS REVEALED IN IDEALIZED EXPERIMENTS. *Robert G. Fovell, Kristen L. Corbosiero and Hung-Chi Kuo (UCLA, USA)*
- P8.10** TURBULENT TRANSPORT AND SURFACE INTERACTIONS WITHIN THE CONVECTIVE BOUNDARY LAYER: AN EVALUATION OF PARAMETERIZATION SCHEMES IN THE WEATHER RESEARCH AND FORECASTING MODEL. *Jeremy Gibbs (University of Oklahoma, USA)*
- P8.11** EVALUATION OF THE ABOVE SURFACE METEOROLOGY OF THE ADVANCED RESEARCH WEATHER RESEARCH AND FORECASTING MODEL VERSION 3. *Robert Gilliam and Jon Pleim (NOAA/ARL, USA)*
- P8.12** EVALUATION OF WRF OVER EUROPE AND AFRICA. *A. Grantinger (Swedish Armed Forces, Sweden)*
- P8.13** THE PERFORMANCE OF THE WRF-ARW MODEL OVER CATALONIA (NE SPAIN) WITH DIFFERENT CONVECTIVE AND MICROPHYSICAL PARAMETERIZATIONS. *J. Mercader, and B. Codina (University of Barcelona, Spain), A. Sairouni, and J. Cunillera. (Meteorological Service of Catalonia, Spain)*
- P8.14** A COMPARISON OF MODEL AND OBSERVED TURBULENT KINETIC ENERGY WITHIN COASTAL BARRIER JETS FORCED BY LANDFALLING CYCLONES. *Joseph Olson and John Brown (NOAA-ESRL, USA)*
- P8.15** MODELING AEROSOL EFFECTS ON THE FORMATION OF POCKETS OF OPEN CELLS IN MARINE STRATOCUMULUS USING WRF MODEL. *Hailong Wang (University of Colorado and NOAA, USA), Graham Feingold (NOAA, USA), and Huiwen Xue (Peking University, China)*

- P8.16** DEPENDENCE OF FORECAST SKILL ON THE CHOICE OF WRF PARAMETERIZATIONS: A SENSITIVITY EXPERIMENT COMPARING TWO SIMILAR HIGH-IMPACT COLORADO LEE CYCLONES. *Paul Nutter and Jonathan Meyer (University of Northern Colorado, USA)*
- P8.17** COMPARISONS OF POLAR WRF AND POLAR MM5 IN ANTARCTICA. *Jordan G. Powers and Kevin W. Manning (NCAR, USA)*
- P8.18** THE FIRST RESULTS OF WRF ARW USE IN UKRAINE. *Shpyg V.M., Budak I.V., Tymofeyev V.E. (Ukrainian Hydrometeorological Institute, Ukraine)*
- P8.19** WRF-ARW MODEL NESTING FORECAST EVALUATION OVER MANAUS CITY IN AMAZONIA. *Teixeira-Silva, Paulo; Silva, Rayson; Candido, Luiz; Tota, Julio; Manzi, Antonio (INPA, Brazil)*
- P8.20** THE WRF DEVELOPMENTAL TESTBED CENTER: ACCOMPLISHMENTS AND OUTLOOK. *Louisa Nance, Robert Gall, and Steve Koch (NCAR, USA)*

#### **Model Applications**

- P9.1** UNDERSTAND FRONTAL PASSAGE OVER THE GREAT LAKES. *Tim Axford, Dr. Hjelmfelt, Dr. Capehart (South Dakota School of Mines and Technology, USA)*
- P9.2** HIGH-RESOLUTION WRF SIMULATIONS FOR SELECTED IOPS DURING THE FIELD EXPERIMENT COPS. *Thomas Schwitalla, Hans-Stefan Bauer, Florian Zus, and Volker Wulfmeyer (University of Hohenheim, Germany)*
- P9.3** SENSITIVITY OF MEDIUM-RANGE FORECASTS IN WRF TO SEA SURFACE TEMPERATURES. *KM Carroll and WJ Capehart (South Dakota School of Mines & Technology, USA)*
- P9.4** A SENSITIVITY STUDY OF THE OPERATIONAL NSSL WRF USING UNIQUE NASA ASSETS. *Jonathan L. Case (ENSCO, Inc., USA), S.R. Dembek (Universities Space Research Association, USA), J.S. Kain (NOAA, USA), S.V. Kumar, T. Matsui, and J.J. Shi (Goddard Earth Sciences and Technology Center, USA), W.M. Lapenta, and W-K. Tao (NASA, USA)*
- P9.5** *Withdrawn*
- P9.6** VARIATION POTENTIAL OF WIND ENERGY IN GUANGDONG PROVIDENCE. *Yim, Steve H L, Fung, Jimmy C H and Lau, Alexis K H (Hong Kong University of Science & Technology, China)*
- P9.7** WRF SIMULATIONS OF ENVIRONMENTAL CONDITIONS CONDUCTIVE TO THE FORMATION OF LAKE-TO-LAKE BANDS. *J. T. George, M. R. Hjelmfelt, W. J. Capehart (South Dakota School of Mines and Technology, USA)*

- P9.8** DEVELOPMENT OF SHORT RANGE ANALYSIS AND PREDICTION SYSTEM. *Jong-Chul Ha, Yong-Hee Lee, Jeong-Soon Lee, Hee-Choon Lee, and Hee-Sang Lee (National Institute of Meteorological Research / KMA, Korea)*
- P9.9** THE FORECASTING SYSTEM FOR WIND POWER GENERATION COMBINED USE OF NUMERICAL AND STATISTICAL MODELS. *Atsushi Hashimoto, Yasuo Hattori, Shinji Kadokura (Central Research Institute of Electric Power Industry, Japan)*
- P9.10** LOCAL AND SYNOPTIC SCALES OF EARLY SUMMER PRECIPITATION SIMULATED BY WRF. *Hiroaki Kawase (Frontier Research Center for Global Change, Japan)*
- P9.11** ANALYSIS OF THE EXTREME FLOODING DURING OCTOBER 2007 IN TABASCO, MEXICO USING THE WRF MODEL. *Valentin Lopez-Mendez, Jorge Zavala-Hidalgo and Rosario Romero-Centeno (Universidad Nacional Autonoma de Mexico, Mexico)*
- P9.12** EXAMINATION OF HYDROLOGICAL CHANGE USING WRF OUTPUT IN THE AGANO RIVER BASIN, JAPAN. *X. Ma, T. Yoshikane, M. Hara, H. Kawase and H. Takahashi (JAMSTEC, Japan) and Fujio Kimura (JAMSTEC & University of Tsukuba, Japan)*
- P9.13** DIURNAL CYCLE OF THE SIMULATED PRECIPITATION IN WRF: PHYSICS SENSITIVITY. *Myung-Seo Koo and Song-You Hong (Yonsei Univ., South Korea)*
- P9.14** USING SATELLITE OBSERVATIONS TO VALIDATE A LARGE-SCALE HIGH-RESOLUTION WRF MODEL SIMULATION. *Jason Otkin, Yong-Keun Lee, Tom Greenwald, Justin Sieglaff, and Ralf Bennartz (University of Wisconsin-Madison, USA)*
- P9.15** LARGE-SCALE WRF MODEL SIMULATIONS USED FOR GOES-R RESEARCH ACTIVITIES. *Jason Otkin, Tom Greenwald, Justin Sieglaff, and Allen Huang (University of Wisconsin-Madison, USA)*
- P9.16** USING HIGH-RESOLUTION WRF MODEL DATA TO BETTER UNDERSTAND SATELLITE-OBSERVED MOUNTAIN WAVE PATTERNS. *Jason Otkin, Kris Bedka, Wayne Feltz, and Tom Greenwald (University of Wisconsin-Madison, USA)*
- P9.17** STUDY ON IMPACT OF SRTM BASED HIGH-RESOLUTION TOPOGRAPHY IN COMPLEX COASTAL AREA. *Hwa-Woon Lee and Soon-Young Park (Pusan National University, Korea)*
- P9.18** THE USE OF WRF FOR WIND RESOURCE MAPPING IN NORWAY. *Øyvind Byrkjedal and Erik Berge (Kjeller Vindteknikk, Norway)*
- P9.19** SIMULATIONS FOR WIND ENERGY RESOURCE ASSESSMENT WITH COUPLED HYDROLOGIC-LAND-SURFACE ATMOSPHERIC MODELS. *R. M. Maxwell, J.K. Lundquist, J. D. Mirocha, Carol Woodward, F. K. Chow, S. J., Kollet (Lawrence Livermore National Laboratory, USA)*

- P9.20** SENSITIVITY OF WATER VAPOR DISTRIBUTION TO THE LAND SURFACE PARAMETERIZATION SCHEMES IN THE ADVANCED WEATHER RESEARCH AND FORECASTING MODEL. *Thara Prabhakaran, Gerrit Hoogenboom and Tatiana G. Smirnova (The University of Georgia, USA)*
- P9.21** THE STRUCTURE OF LOW-LEVEL JET IN THE SOUTHEASTERN USA FROM WRF MODEL. *Thara Prabhakaran, Gerrit Hoogenboom and Alan Norton (The University of Georgia, USA)*
- P9.22** A STUDY OF OCEAN-ATMOSPHERIC INTERACTIONS AND ASSOCIATED TROPICAL CYCLONE/HURRICANE ACTIVITY OVER THE GULF OF MEXICO USING COUPLED ATMOSPHERIC MODELING SYSTEM (CAM5). *R. Suseela Reddy and Duanjun Lu (Jackson State University, USA)*
- P9.23** IDEALIZED MODELING OF THE ROLE OF STABILITY AND SHEAR ON MESOSCALE GRAVITY WAVE EVOLUTION. *Michelle Pitcel, Brian Jewett, Bob Rauber, and Greg McFarquhar (University of Illinois, USA)*
- P9.24** IDEALIZED MESOSCALE SIMULATIONS OF SURFACE-HETEROGENEITY DRIVEN CIRCULATIONS. *Brian P. Reen, George S. Young, David P. Tyndall, David R. Stauffer (Pennsylvania State University, USA)*
- P9.25** THE EFFECTS OF URBANIZATION ON THE LOCAL WEATHER AND CLIMATE OF CHICAGO, IL. *Kate Smith and Paul J. Roebber (UW-Milwaukee, USA)*
- P9.26** HIGH-RESOLUTION WEATHER AND AIR QUALITY FORECASTS FOR ZEELAND, THE NETHERLANDS. *Hein Zelle, Agnes Mika (ARGOSS, The Netherlands)*
- P9.27** AN OSSE STUDY FOR THE TIMREX FIELD PROJECT. *Shu-Hua Chen, Jhih-Ying Chen, Wei-Yu Chang, Pay-Liam Lin, Po-Hsiung Lin, Wen-Yih Sun, Tai-Chi Chen, Yu-Chieng Liou (UC Davis, USA)*
- P9.28** ESTIMATING THE REFRACTIVE INDEX STRUCTURE-FUNCTION AND RELATED OPTICAL SEEING PARAMETERS WITH THE WRF-ARW. *Eric M. Kemp, Billy D. Felton, and Randall J. Alliss (Northrop Grumman Information Technology/TASC, USA)*
- P9.29** FLASH FLOOD PREDICTION USING LIGHTNING DENSITY DERIVED FROM WRF MODEL DYNAMIC AND MICROPHYSICAL FIELDS (I.E, THE "POWER INDEX"). *Barry Lynn (Weather It Is, LTD, Israel) and Yoav Yair (The Open University, Israel)*
- P9.30** PRELIMINARY EVALUATION OF A SHORT-RANGE ENSEMBLE PREDICTION SYSTEM OVER WESTERN MEDITERRANEAN. *D. Santos-Muñoz, M.L. Martín M.L., A. Morata, and F. Valero (AEMET, Spain)*
- P9.31** USING JOINT MESOSCALE ENSEMBLE (JME) SOFTWARE FOR WRF ENSEMBLE FORECASTING. *J. Schramm, T. Henderson and D. Gill (NCAR, USA)*

- P9.32** USING NCSA/LEAD'S WORKFLOW BROKER TO STUDY STORM INTERACTION WITH WRF. *Brian Jewett, Robert B. Wilhelmson, Jay C. Alameda and Albert L. Rossi (University of Illinois, USA)*

**Computing Tools and Issues**

- P11.1** HOW THE NCSA/LEAD WORKFLOW BROKER MANAGES COMPLEX WORKFLOWS. *J. Alameda, Brian Jewett, Robert B. Wilhelmson, Albert L. Rossi Shawn D. Hampton (University of Illinois, USA)*
- P11.2** USING WRF PORTAL AT THE DTC. *Mark Govett and Jeff Smith (NOAA Earth System Research Laboratory, USA)*
- P11.3** VAPOR: A 3D VISUALIZATION TOOL FOR WRF-ARW DATASETS. *A. Norton, NCAR/CISL*
- P11.4** THE WRF MODEL AND FORTRAN ARRAY SYNTAX: OIL AND WATER? *Steven Decker (Rutgers, the State University of New Jersey, USA)*
- P11.5** PERFORMANCE CHARACTERIZATION OF WRF ON INTEL® PLATFORMS. *R. Dubtsov, A. Semenov, D. Shkurko (Intel Co, Russia)*
- P11.6** EFFECT OF NON-IEEE-COMPLIANT OPTIMIZATIONS ON WRF NUMERICAL RESULTS. *Gerardo Cisneros (Silicon Graphics, Mexico), Scott R. Dembek (NASA, USA), Jimmy Dudhia (NCAR, USA), and Jack Kain (NOAA, USA)*

**FRIDAY – JUNE 27, 2008**

**Instructional Sessions**

**8:30 – 12:00 Friday, June 27**

**LEAD**

**8:30 – 10:00**

LEAD (Linked Environments for Atmospheric Discovery) is a web services environment for meteorological research and education. It allows users to query for and obtain a wide variety of observations and model data, assimilate data, configure and run WRF model forecasts, and mine and visualize observations and model output -- all in a single, comprehensive system that is as easy to use as ordering a book on amazon.com. Unique to LEAD is the ability for its weather tools, including WRF, to operate in a dynamically adaptive manner. For example, LEAD can be configured to monitor streaming radar data and launch a WRF forecast, automatically, when a pre-specified condition is met (e.g., an echo of 35 dBZ forms over a particular region). The LEAD system will locate the necessary computing resources for the WRF run on the NSF Teragrid and then monitor the execution of the job, restarting any component of the workflow that fails. In this tutorial, attendees will be shown how to use LEAD and will configure and launch their own radar data mining and WRF runs, on demand, over any region they choose. We also will show how LEAD is being interfaced with the WRF Portal being developed by NCAR and NOAA.

**PS: Bring your laptop with wireless cards.**

**MET**

**10:30 – 12:00**

This instructional session will provide an overview of the Model Evaluation Tools (MET), including its major components and technical capabilities and requirements. MET is a set of verification tools designed by the Developmental Testbed Center (DTC) for evaluation of WRF model forecasts. This session will include a description of the basic components of MET, as well as new tools that will be included in Version 1.1, which will be released in early July. Some of the new tools include neighborhood verification methods, conversion tools to allow additional observational data formats, and bootstrap-based confidence intervals. The session will not be hands-on due to time constraints, but copies of the presentation will be provided, as well as links to FAQs and an on-line tutorial.

**VAPOR**

**9:00 – 10:30**

This tutorial presents a variety of techniques for understanding WRF output through the use of 3D visualization. The goal is to enable attendees to easily incorporate 3D graphics into the analysis of WRF output. Attendees are not expected to be familiar with 3D graphics; however they are encouraged to bring a laptop to work through the examples as they are discussed. The visualization will be performed using VAPOR (see <http://www.vapor.edu>), an interactive visualization tool that has been developed at NCAR for the understanding of turbulence data.

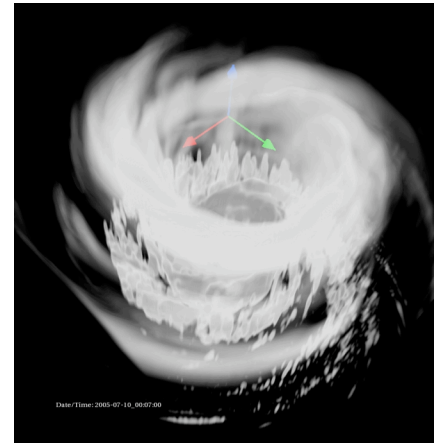
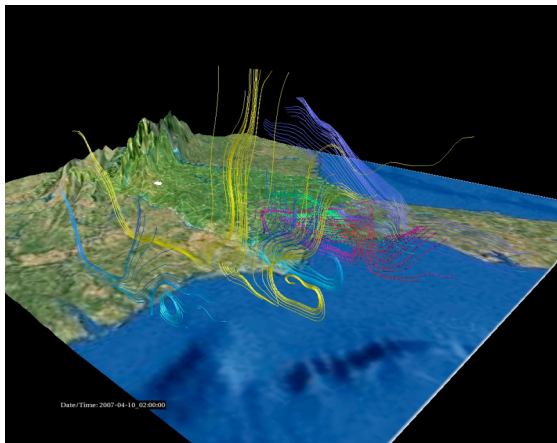
Visualization techniques that will be explained include:

*Volume visualization; Isosurfaces; Flow integration; Data probing with contour planes; Image-based flow visualization; Animation*

Several examples will be used to illustrate the use of visualization to understand WRF-ARW output data. Weather phenomena visualized include:

*Dispersion of pollutants over time; Flow stagnation; Cold air damming; Convection near the eye of a hurricane; Identification of vortices*

**Right:** VAPOR visualization of convection near Gulf Coast, QCLOUD in a simulated hurricane.



For those who will be bringing laptops to use in this tutorial: You can run Linux, Windows, or Mac OSX. The examples will work best on laptops that are fairly new (*less than 3 years old*) and that have nVidia or ATI graphics cards.

**PS: Bring your laptop with wireless cards.**