

AGENDA

Twenty-first Annual George Mason University Conference on Atmospheric Transport and Dispersion Modeling

June 13-15, 2017

Conference Chairs:

Joseph Chang, RAND Corporation, Arlington, VA
Zafer Boybeyi, George Mason University, Fairfax, VA

Enterprise Hall, Room 80
George Mason University, Fairfax, VA

Last updated: 6/7/2017

DAY 1 (June 13)

Session 1-Nuclear Applications

Chair: Joe Chang, RAND Corporation

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| 8:30 AM | 8:40 AM | Welcoming Remarks |
| 8:40 AM | 9:00 AM | Source Term and Atmospheric Transport and Dispersion Modeling of the Fukushima Daiichi Accident
Nathan E. Bixler and Daniel J. Clayton
<i>Sandia National Laboratories, Albuquerque, NM</i> |
| 9:00 AM | 9:20 AM | MACCS-HYSPLIT Atmospheric Transport and Dispersion Model Benchmarking
Daniel J. Clayton, Nathan E. Bixler, and Keith L. Compton
<i>Sandia National Laboratories, Albuquerque, NM; and U.S. Nuclear Regulatory Commission, Washington, DC</i> |
| 9:20 AM | 9:40 AM | The UK's Joint Agency Modelling (JAM) Process for Emergency Response to Civilian Nuclear Incidents
Lois Huggett, Sarah Millington, and Susan Leadbetter
<i>UK Met Office, Exeter, Devon, UK</i> |
| 9:40 AM | 10:00 AM | A New Method to Detect Nuclear Testing with Atmospheric Measurements: The Feb 2013 Underground Test in North Korea
Robert J. Kurzeja, Robert L Buckley, David W. Werth, and Steven R. Chiswell
<i>Savannah River National Laboratory, Aiken, SC</i> |
| 10:00 AM | 10:30 AM | COFFEE BREAK |

Session 2-Mesoscale and Indoor Applications

Chair: Tom Spicer, University of Arkansas

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| 10:30 AM | 10:50 AM | Transition of the 3DWF Model from Linux to Windows and Mobile Platforms
Giap Huynh, Yansen Wang, and Chatt Williamson
<i>U.S. Army Research Laboratory, Adelphi, MD</i> |
| 10:50 AM | 11:10 AM | Ensemble Atmospheric Modeling Techniques Applied to Mesoscale Dispersion
Robert Buckley, Steven Chiswell, Robert Kurzeja, Grace Maze, Brian Viner, and David Werth
<i>Savannah River National Laboratory, Aiken, SC</i> |
| 11:10 AM | 11:30 AM | Rethinking What it Means to be a Box Model
David M. Lorenzetti
<i>Lawrence Berkeley National Laboratory, Berkeley, CA</i> |
| 11:30 AM | 11:50 AM | Approaches to Implementing Interior CBRN Models in HPAC
David Lorenzetti, George Bieberbach, Jonathan Hurst, Paul Bieringer, and Michael Sohn
<i>Lawrence Berkeley National Laboratory, Berkeley, CA</i> |

11:50 AM 1:10 PM **LUNCH BREAK**

Session 3-Special OFCM Session (1)

Field Experiments, Observational Networks, and Updates to Dispersion Model Capabilities

Chair: Jeff McQueen, NOAA/National Weather Service

- 1:10 PM 1:20 PM **OFCM Session Introduction**
Jeff McQueen and Judson Stailey
NOAA and Office of the Federal Coordinator for Meteorology
- 1:20 PM 1:40 PM **Update on Army Research Lab's Efforts to Establish a Meteorological Sensor Array at White Sands Missile Range**
Chatt Williamson, Chris Hocut, Jeffrey Smith, Rob Brice, Jeff Swanson, Ed Creegan, Sean D'Arcy, and Ben MacCall
U.S. Army Research Laboratory, Adelphi, MD
- 1:40 PM 2:00 PM **The National Weather Service's Ceilometer Lidar Network**
Michael Hicks, Dennis Atkinson, Belay Demoz, Kevin Vermeesch, and Ruben Delgado
National Weather Service, Silver Spring, MD
- 2:00 PM 2:20 PM **Ad-Hoc Ceilometer Evaluation Study (ACES): Evaluation of Lidars and Ceilometers Mixing Heights**
Ruben Delgado, Belay Demoz, James S. Szykman, Kevin Vermeesch, Jasper Lewis, Brian Carroll, Benjamin Tucker, Tahmid Abtahi, Travis N. Knapp, Ricardo Sakai, Ellsworth J. Welton, Michael Hicks, and Dennis Atkinson
University of Maryland, Baltimore County, Baltimore, MD
- 2:20 PM 2:40 PM **Routine Large-Eddy Simulations of Continental Shallow Convection: Simulation Workflow Development and Megasite Observations**
Andrew Vogelmann, William I. Gustafson Jr., Zhijin Li, Xiaoping Cheng, Satoshi Endo, Bhargavi Krishna, Tami Toto, and Heng Xiao
Brookhaven National Laboratory, Upton, NY
- 2:40 PM 3:10 PM **COFFEE BREAK**

Session 4-Special OFCM Session (2)

Field Experiments, Observational Networks, and Updates to Dispersion Model Capabilities

Chair: Judson Stailey, OFCM

- 3:10 PM 3:30 PM **A Long-Term WRF Meteorological Archive for Dispersion Simulations: Application to Controlled Tracer Experiments**
Fong (Fantine) Ngan and Ariel Stein
NOAA/Air Resources Laboratory, College Park, MD
- 3:30 PM 3:50 PM **Overview of HYSPLIT applications at the National Weather Service**
Chris Wamsley
National Weather Service, Silver Spring, MD
- 3:50 PM 4:10 PM **Navy Aerosol Forecasting: The Power in Ensembles**
Juli Rubin, James Hansen, Jim Peak, Jeffrey Reid, Doug Westphal, Peng Xian, Jeff Anderson, and Milija Zupanski
Naval Research Laboratory, Washington, D.C.
- 4:10 PM 4:30 PM **Dugway Proving Ground Field Site and UAS Research**
TBD
TBD
- 4:30 PM 4:50 PM **DTRA Dispersion Modeling**
TBD
TBD
- 4:50 PM 5:20 PM **Discussion, Future Needs, and Science Priorities**

5:20 PM

DAY 2 (June 14)

Session 5-Jack Rabbit II Field Experiment (1)

Chair: Steve Hanna, Hanna Consultants

- 8:00 AM 8:20 AM **Overview of the 2016 Jack Rabbit II Chlorine Release Field Trials**
Shannon Fox, Ronald Meris, Leo Stockham, Ronald Meris, Thomas Mazzola, Joseph Chang, Steven Hanna, Thomas Spicer, Michael Sohn, Damon Nicholson, and Andy Byrnes
Department of Homeland Security, Chemical Security Analysis Center, Aberdeen Proving Ground, MD
- 8:20 AM 8:40 AM **Collaboration within the Jack Rabbit II Modeling Working Group**
Ronald G. Meris and Thomas A. Mazzola
Defense Threat Reduction Agency, Fort Belvoir, VA
- 8:40 AM 9:00 AM **CFD Model Predictions of the Near-field Dispersion Behavior in the Jack Rabbit II Experiments**
Simon Gant and Harvey Tucker
Health and Safety Laboratory, Harpur Hill, Buxton, UK
- 9:00 AM 9:20 AM **Validation of QUIC-RAILCAR and ALOHA-RAILCAR Against the Jack Rabbit II 2015 Field Trial Data**
Timothy J. Bauer,
Naval Surface Warfare Center Dahlgren, Dahlgren, VA
- 9:20 AM 9:40 AM **Integral Model Predictions of the Jack Rabbit II 2015 Experiments Using DRIFT and PHAST**
Simon Gant, Bryan McKenna, Maria Mallafrè Garcia, Harvey Tucker, Graham Tickle, and Henk Witlox
Health and Safety Laboratory, Harpur Hill, Buxton, UK
- 9:40 AM 10:10 AM **COFFEE BREAK**

Session 6-Jack Rabbit II Field Experiment (2)

Chair: Thomas Mazzola, Engility Corporation

- 10:10 AM 10:30 AM **Large Eddy Simulations of Dense Gas Release in a Mock Urban Environment and Comparison with the Jack Rabbit II Field Trials**
Thomas Vik
The Norwegian Defence Research Establishment, Kjeller, Norway
- 10:30 AM 10:50 AM **An Application of the Global Climatology Analysis Tool (GCAT) to the Jack Rabbit Field Campaign**
Stefano Alessandrini
National Center for Atmospheric Research, Boulder, CO
- 10:50 AM 11:10 AM **Downwind Chlorine Hazard Estimates for the 2015 Jack Rabbit II Campaign**
Kevin Luong, Nathan Platt, and Jeffry T. Urban
Institute for Defense Analyses, Alexandria, VA
- 11:10 AM 11:30 AM **Inclusion of Jack Rabbit II 2016 Field Data in Testing of Similarity Relations for Variation of Maximum Concentrations with Downwind Distance**
Steven Hanna, Joseph Chang, and Thomas Mazzola
Hanna Consultants, Kennebunkport, ME
- 11:30 AM 11:50 AM **Integral Puff Modeling of Dense Gas Dispersion for Jack Rabbit II**
J.C. Weil, D. Steinhoff, and L. Delle Monache

National Center for Atmospheric Research, Boulder, CO

11:50 AM 12:10 PM

Relative Importance of Outdoor T&D Models when Predicting Sheltering-in-Place in Buildings and Vehicles from an Outdoor Chlorine Release

Michael Sohn, William Delp, Yang-Seon Kim, Andrew Byrnes, and David Matthew
Lawrence Berkeley National Laboratory, Berkeley, CA

12:10 PM 1:30 PM

LUNCH BREAK

Session 7-Jack Rabbit II Field Experiment (3)

Chair: George Bieberbach, Aeris LLC

1:30 PM 1:50 PM

Jack Rabbit II Field Test Program Analysis of Mass Release Rate and Rainout

Tom Spicer
University of Arkansas, Fayetteville, AR

1:50 PM 2:10 PM

Modeling of the 2016 Jack Rabbit II Releases

Rick Babarsky and Joe Leung
U.S. Army, Charlottesville, VA

2:10 PM 2:30 PM

Remote Sensing of Chlorine Using UV Lidar at U.S. Army Dugway Proving Ground

James T. Pearson
U.S. Army Dugway Proving Ground, Dugway, UT

2:30 PM 2:50 PM

Analysis of Jack Rabbit II Chlorine Clouds with UV Lidar

Thomas A. Mazzola and James T. Pearson
Engility, Fort Belvoir, VA

2:50 PM 3:10 PM

Experiments to Model Chlorine Reactivity with Environmental Materials under Relevant, Controlled Conditions

Tom Spicer, Bruce Hicks, Audrey Feuvrier, and Shannon Fox
University of Arkansas, Fayetteville, AR

3:10 PM 3:40 PM

COFFEE BREAK

Session 8-DTRA Reachback

Chair: Ron Meris, Defense Threat Reduction Agency

3:40 PM 4:00 PM

DTRA Technical Reachback Support of Jack Rabbit II Testing: Analysis/Comparison of HPAC Models and Test Data from JR II Trials 6 – 9

Steven Simpson and Sean Miner
Defense Threat Reduction Agency, Fort Belvoir, VA

4:00 PM 4:20 PM

A Comparison of the Urban Dispersion Modeling (UDM) and Urban Canopy (UC) Performance for the Joint Urban 2003 Urban Dispersion Experiment

Sean Miner and Thomas Mazzola
Defense Threat Reduction Agency, Fort Belvoir, VA

4:20 PM 4:40 PM

HPAC 6.4 Model Validation and Analysis: Assessing DTRA Reachback Real World Cases

Yaítza Luna-Cruz and Scott Runyon
Defense Threat Reduction Agency, Fort Belvoir, VA

4:40 PM 5:00 PM

HPAC Validation Event: The 2016 Al-Mishraq Sulphur Fire

Scott Bradley and Joel Howard
Defense Threat Reduction Agency, Fort Belvoir, VA

5:00 PM 5:20 PM

Al-Mishraq, a Case Study Using Satellite Data Aided Dispersion Modelling

Oscar Björnham, Håkan Grahn, Pontus von Schoenberg, Annica Waleij, Birgitta Liljedahl, and Niklas Brännström
FOI, Swedish Defence Research Agency, Stockholm, Sweden

5:20 PM

DAY 2 ADJOURNS

DAY 3 (June 15)

Session 9-Emergent Technology for Tracer Experiments

Chair: Julie Pullen, Steven Institute of Technology

- 8:30 AM 8:50 AM **Coupling Meteorological Measurements with Perfluorocarbon Tracers for Next Generation Urban Dispersion Experiments**
Thomas B. Watson
Brookhaven National Laboratory, Upton, NY
- 8:50 AM 9:10 AM **Validating Urban-Scale Transport Models using Airborne LWIR HSI Sensing**
Kerry N. Buckland, Eric R. Keim, Jeffrey L. Hall, Tamara L. Volquarts, Karl R. Westberg, and David M. Tratt
The Aerospace Corporation, Los Angeles, CA
- 9:10 AM 9:30 AM **Coupling Large-scale Meteorology and Urban Boundary Layer Turbulence Using Remote Sensing for Next Generation Urban Dispersion Experiments**
Pavlos Kollias, Julie Pullen, Thomas Watson, Alice Cialella, and Martin Schoonen
Brookhaven National Laboratory, Upton, NY
- 9:30 AM 9:50 AM **Coastal Air-Sea Boundary Layer Processes: A Measurement and Modeling Perspective**
Paul T. Gayes, S. Bao, Len J. Pietrafesa, J. Hallstrom, X. Li, M. Xia, J. Pullen, and A. Blumberg
Coastal Carolina University, Conway, SC
- 9:50 AM 10:10 AM **Challenges with Land Cover Categories in the Continued Development of AERSURFACE**
Clint Tillerson and Roger Brode
U.S. Environmental Protection Agency, Research Triangle Park, NC
- 10:10 AM 10:30 AM **The Path Forward on Prognostic Meteorological Data in PSD Applications**
Chris Misenis, James Thurman, Clint Tillerson
U.S. Environmental Protection Agency, Research Triangle Park, NC
- 10:30 AM 11:00 AM **COFFEE BREAK**

Session 10-Urban Applications (1)

Chair: Martin Schoonen, Brookhaven National Laboratory

- 11:00 AM 11:20 AM **Improvement of the New Micro-SWIFT Momentum Solver to Represent Flow and Dispersion on Steep Slopes with Buildings**
M. Nibart, L. Makke, B. Sohet, Jacques Moussafir
ARIA Technologies, Boulogne-Billancourt, France
- 11:20 AM 11:40 AM **Atmospheric Boundary Flow Simulations Using a Lattice Boltzmann Model**
Yansen Wang, Xiping Zeng, Giap Huynh, and Leelinda Dawson
U.S. Army Research Laboratory, Adelphi, MD
- 11:40 AM 12:00 PM **A Simple Analytical Urban Puff Dispersion Model Compared with JU2003 Tracer Data**
Steven Hanna and Joseph Chang
Hanna Consultants, Kennebunkport, ME
- 12:00 PM 12:20 PM **Single Realization, Coupled, LES-Based Urban and Indoor Airborne Contaminant Modeling Platform**
Paul E. Bieringer, Michael D. Sohn, Aaron Piña, George Bieberbach, and David Lorenzetti
Aeris LLC, Louisville, CO
- 12:20 PM 1:40 PM **LUNCH BREAK**

Session 11-Urban Applications (2)

Chair: Zafer Boybeyi, George Mason University

- 1:40 PM 2:00 PM **Development of Database/Website for DTRA Programs MUST, JU03, FFT07, and Jack Rabbit II**
Eugene L. Vickers and John Carnahan
U.S. Army Edgewood Chemical Biological Center, Edgewood, MD

- 2:00 PM 2:20 PM **Prototype NRBC Response Application Coupling 3D Scanning Lidar and PMSS**
Y. Ma, B. Wong; M. Nibart, F.Gomez, B. Guillaume, Jacques Moussafir; R. Parmentier,
L.Thobois
DSO, Singapore; ARIA Technologies, Boulogne-Billancourt, France; LEOSPHERE, France
- 2:20 PM 2:40 PM **A City-wide Study of the Ventilation of the New Areas of Wuhan Using PMSS**
Y. Yi, W. Kallej; A. Albergel, M. Nibart, L.Ricolleau, Q.Zhang, Jacques Moussafir
WPDI, Wuhan Planning Bureau, China; ARIA Technologies, Boulogne-Billancourt, France
- 2:40 PM **DAY 3 ADJOURNS**