

AGENDA

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

November 2-4, 2021

Conference Chairs:

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

Virtual Platform

All times in Eastern Daylight Time (UTC - 4)

Zoom link will be provided in email

DAY 1 (November 2)

Session 1-Capability Review and Model Evaluation

Chair:

- 9:40 AM 10:00 AM Virtual meet and greet
All
- 10:00 AM 10:15 AM **Recent work and future plans of the Atmospheric Dispersion Modelling Liaison Committee (ADMLC)**
Simon Gant
Health and Safety Executive, Buxton, UK
- 10:15 AM 10:30 AM **Atmospheric Dispersion Studies at Electricité de France : History and Perspectives**
Bertrand Carissimo
*Centre d'Enseignement et de Recherche en Environnement Atmosphérique (CEREA)
Laboratoire commun ENPC - EDF R&D, Chatou, France*
- 10:30 AM 10:45 AM **Computational Comparisons to the Multi-stack MRC/MRV Dispersion Dataset**
Alexander L. Brown¹, Michael D. Clemenson¹, Ty Homan², Andrew Banko², Michael J. Benson², Christopher J. Elkins³
¹*Sandia National Laboratories, Albuquerque, NM;* ²*US Military Academy, West Point, NY;*
³*Stanford University, Stanford, CA*
- 10:45 AM 11:00 AM **Use of WRF TKE in SCIPUFF: CAPTEX Field Test Comparison**
Douglas Henn, Glenn Hunter, David Stauffer, Jerred Jesse and Ian Sykes
Xator Corporation
- 11:00 AM 11:45 AM **BREAK**

Session 2-Urban Modeling (1)

Chair:

- 11:45 AM 12:00 PM **UrbanAware Labs: A Reappraisal of the Behaviour of UDM**
Martyn Bull, Tim Hughes, Rory Gordon, Murray Purves
Riskaware, Bristol, UK

- 12:00 PM 12:15 PM **Detailed Measurements of a Building Wake under Real-World Atmospheric Conditions**
 Matthew Nelson, Nicolas Duboc, Patrick Conry, Adrainna Ortega, Rod Linn, Suhas Pol, Hussnain Shah, Trey Gloeckler, Paul Bieringer, Andrew Annunzio, Brian Martin, and Heidi Tennesand
Los Alamos National Laboratory, Los Alamos, NM
- 12:15 PM 12:30 PM **Development of a Diffusive Building-Wake Model using Machine-Learning Trained by LES Simulations**
 Nicolas Duboc, Matthew Nelson, Paolo Patelli, Patrick Conry, Rod Linn, Paul Bieringer, Andrew Annunzio, Brian Martin, and Heidi Tennesand
Los Alamos National Laboratory, Los Alamos, NM
- 12:30 PM 12:45 PM **Parametrization of Exchanges in Street Canyons with Trees Based on CFD Simulations**
 Alice Maison^{1,2}, Cédric Flageul^{1,3}, Carissimo Bertrand¹, Wang Yunyi¹, Tuzet Andrée², Karine Sartelet¹
¹ *Centre d'Enseignement et de Recherche en Environnement Atmosphérique (CEREA) EDF R&D, Marne-la-Vallée, France;* ² *Université Paris-Saclay, Thiverval-Grignon, France;* ³ *PPRIME Institute, Université de Poitiers, France*
- 12:45 PM 1:00 PM **Impact of Tree-Related Processes on the Air Quality in a Street Canyon Using CFD Coupled with Chemical Module SSH-Aerosol**
 Wang Yunyi¹, Cédric Flageul², Alice Maison¹, Carissimo Bertrand¹, Karine Sartelet¹
¹ *Centre d'Enseignement et de Recherche en Environnement Atmosphérique (CEREA) EDF R&D, Marne-la-Vallée, France;* ² *PPRIME Institute, Université de Poitiers, France*

1:00 PM 1:45 PM **BREAK**

Session 3-Urban Modeling (2)

Chair:

- 1:45 PM 2:00 PM **Integrated Urban Models in HPAC**
 Michael D. Sohn¹, Paul E. Bieringer², Russell Mills³, Steven Emmerich⁴, Scott Kreyenhagen², Stephen Kinsch², Peter Melling³, W. Stuart Dols⁴, Brian Polidoro⁴, Jon Hurst², Martyn Bull³, Benjamin Kandel², George Bieberbach², David Lorenzetti¹
¹ *Lawrence Berkeley National Laboratory, Berkeley, CA;* ² *Aeris LLC, Louisville, CO;* ³ *Riskaware Ltd, Bristol, UK;* ⁴ *National Institute of Standards and Technology, Gaithersburg, MD*
- 2:00 PM 2:15 PM **Experimental Campaign of CO₂ Massive Atmospheric Releases in an Urban Area : Preliminary Results and Modeling Comparisons**
 Guillaume Leroy, Lauris Joubert, Théo Claude
INERIS, Verneuil-en-Halatte, France
- 2:15 PM 2:30 PM **Vertical Air Motion Measurements Along the Façades of a Supertall Building Point to Heat as Mechanism for Vigorous Mixing**
 Katia Lamer¹, E. P. Luke¹, Z. Mages², E. C. Leghart², Z. Zhu², and A. Vogelmann¹
¹ *Brookhaven National Laboratory, Upton, NY;* ² *Stony Brook University, Stony Brook, NY*

2:30 PM 2:45 PM **Measuring the 3D Structure of Flow and Dispersion in the Urban Canopy using Magnetic Resonance Imaging: Experiments for Model Development and Validation**

Michael J. Benson¹, Andrew J. Banko¹, Ty Homan¹, Christopher J. Elkins²

¹ *United States Military Academy, West Point, NY;* ² *Stanford University, Stanford, CA*

2:45 PM

DAY 1 ADJOURNS

DAY 2 (November 3)

Session 4-Air Quality and Deposition

Chair:

10:00 AM 10:15 AM **A Global Modeling System (GMS) for High Resolution Meteorological and Air Pollution Forecasts - Framework and Prototype**

Roberto Bianconi¹, Roberto Bellasio¹, Paolo Zannetti²

¹ *Enviroware s.r.l., Italy;* ² *the EnviroComp Institute, Half Moon Bay, CA*

10:15 AM 10:30 AM **Air Quality Modeling with PMSS in Different Cities**

Maxime NIBART, Bruno RIBSTEIN, Lydia RICOLLEAU, Gianni TINARELLI, Daniela BARBERO, Armand ALBERGEL, Jacques MOUSSAFIR

ARIA Technologies, France

10:30 AM 10:45 AM **Canopy Transfer, and the Forgotten Resistance**

Bruce B. Hicks

MetCorps, Norris, TN

10:45 AM 11:00 AM **Chlorine Reactivity with Environmental Materials for Consequence Assessment in Atmospheric Dispersion Models**

Thomas O. Spicer¹, Bruce B. Hicks²

¹ *University of Arkansas, Fayetteville, AR;* ² *MetCorps, Norris, TN*

11:00 AM 11:45 AM **BREAK**

Session 5-Jack Rabbit II

Chair:

11:45 AM 12:00 PM **Results of Comparisons of the Predictions of 17 Dense Gas Dispersion Models with Observations from the Jack Rabbit II Chlorine Field Experiment**

Thomas Mazzola

Systems Planning and Analysis, Alexandria, VA

12:00 PM 12:15 PM **Plume Rise and Touchdown During Jack Rabbit Trial 8**

Steven Hanna, Thomas Mazzola, Graham Tickle, and Simon Gant

Hanna Consultants, Kennebunkport, ME

12:15 PM 12:30 PM **Physical and Mathematical Modelling of the Near-Source Region of Jack Rabbit II Mock Urban Environment Chlorine Releases**

Tom Spicer, Chad Smith

University of Arkansas, Fayetteville, AR

12:30 PM 12:45 PM **Comments on the Performance of JR II Disseminator Instrumentation and Suggested Modifications for JR III**

Rick Babarsky¹, Joe Leung²

¹ *National Ground Intelligence Center, Charlottesville, VA;* ² *Leung Inc.*

12:45 PM 1:30 PM **BREAK**

Session 6-Jack Rabbit III Special Session

Chair:

- 1:30 PM 1:35 PM **Introductory Remarks for JR III Session**
Ron Meris
Defense Threat Reduction Agency, Fort Belvoir, VA
- 1:35 PM 1:50 PM **Jack Rabbit III: Filling Critical Atmospheric Dispersion Modeling Gaps for Emergency Planning and Response**
Shannon Fox¹, Ronald Meris², Sun McMasters¹, and Brian Owen¹
¹ *DHS Chemical Security Analysis Center, Edgewood, MD;* ² *Defense Threat Reduction Agency, Ft. Belvoir, VA*
- 1:50 PM 2:05 PM **Jack Rabbit III Small-scale Outdoor Ammonia Release Trial**
Sun McMasters¹, Brian Owen¹, Sarah Bereznicki¹, Dante Steller², Ronald Meris³, Scott Bradley³, Thomas Mazzola³, Andrew Byrnes⁴
¹ *DHS Chemical Security Analysis Center, Edgewood, MD;* ² *DHS Federal Emergency Management Administration, Washington DC,* ³ *Defense Threat Reduction Agency, Ft. Belvoir, VA;* ⁴ *Utah Valley University, Provo, UT*
- 2:05 PM 2:20 PM **Evaluating Detection Techniques for an Anhydrous Ammonia Release**
Eric R. Languirand
U.S. Army Combat Capabilities Development Command Chemical Biological Center, Aberdeen Proving Ground, MD
- 2:20 PM 2:35 PM **Jack Rabbit III Modelers Working Group: Initial Model Inter-comparison Exercise for 2021-22**
Joseph Chang¹, Simon Gant², Ron Meris, Sun McMasters, Steve Hanna, Tom Spicer, Tom Mazzola
¹ *Rand Corporation, Arlington, VA, USA;* ² *Health and Safety Executive, Buxton, UK*
- 2:35 PM 2:50 PM **Deposition and Surface Chemical Reactivity Knowledge Gaps**
Steven R. Hanna
Hanna Consultants, Kennebunkport, ME
- 2:50 PM 3:05 PM **Hazard Assessment of a Waterborne Anhydrous Ammonia Release**
Peter Egli, Matthew Ward, David Segala, Jenna Cragan
Maritime Planning Associates, Inc., Newport, RI
- 3:05 PM **DAY 2 ADJOURNS**

DAY 3 (November 4)

Session 7-Nuclear Modeling and Data Sets

Chair:

- 10:00 AM 10:15 AM **Overview of the DELFIC Atmospheric Transport Model for Nuclear Fallout Modeling**
Matthew J. Krupcale
Oak Ridge National Laboratory, Oak Ridge, TN
- 10:15 AM 10:30 AM **Connecting Nuclear Cloud Rise Dynamics to Regional Fallout Using a High-fidelity Coupled Modeling Approach**
Robert S. Arthur, Katherine A. Lundquist, Stephanie Neuscammann, Peter Goldstein, and John S. Nasstrom
Lawrence Livermore National Laboratory, Livermore, CA
- 10:30 AM 10:45 AM **Automation of Source Term Estimation Using HYSPLIT**
Preetma Soin

Nuclear Threat Reduction, AWE, Reading, UK

10:45 AM 11:00 AM **Data Archive of Tracer Experiments and Meteorology (DATEM) for Dispersion Models Evaluations**

Fong Ngan^{1,2} and Mark Cohen¹

¹ *National Oceanic and Atmospheric Administration/Air Resources Laboratory, College Park, MD;* ² *Cooperative Institute for Satellites Earth System Studies, University of Maryland, College Park, MD*

11:00 AM 11:15 AM **Status on The Development of Database/Website for DTRA Programs MUST, JU03, and FFT07**

Eugene Vickers¹, Don Fazenbaker¹, Gerita Cochran², Khadijah Boykin²

¹ *U.S. Army Combat Capabilities Development Command - Chemical Biological Center, Aberdeen Proving Ground, MD;* ² *Norfolk State University, Norfolk, VA*

11:15 AM 11:30 AM **Anomaly Detection of LandScan Population Data using Fuzzy Logic**

Peter A. Rochford and Lawrence Shi
Xator Corporation

11:30 AM 12:15 PM **BREAK**

Session 8-Dispersion Modeling Techniques

Chair:

12:15 PM 12:30 PM **Stand-off CBRNE Sensor Simulations with HPAC Analyst**

Steven Schneider, Douglas Henn, and Peter A. Rochford
Xator Corporation

12:30 PM 12:45 PM **Prototype Chemical Fires Module**

Stephen Davis, Jayda Meisel, Tesema Chekol, James Reuther, Brian Pate
Defense Threat Reduction Agency, Ft. Belvoir, VA

12:45 PM 1:00 PM **Nearfield Consequence Analysis Using the MACCS Code**

Daniel J. Clayton
Sandia National Laboratories, Albuquerque, NM

1:00 PM 1:15 PM **Application of an Internal Boundary Layer Model for Estimates of Surface Meteorology**

Chris Owen, Melissa Buechlein, Michelle Snyder, Akula Venkatram, Clint Tillerson, James Thurman, George Bridgers, and Alyssa Zimmerman
Environmental Protection Agency, Research Triangle Park, NC

1:15 PM 1:30 PM **Challenges in Determining Representative Surface Characteristics for Dispersion Modeling**

Clint Tillerson, Chris Owen
Environmental Protection Agency, Research Triangle Park, NC

1:30 PM 2:15 PM **BREAK**

Session 9-Flow Analysis

Chair:

2:15 PM 2:30 PM **HPAC Wind Field Analysis: A Validation Study Using Reanalysis Weather, NWP and ASOS Data**

Leann Anthony, Jimmie Trigg
Applied Research Associates (ARA), DTRA Technical Reachback, Ft. Belvoir, VA

2:30 PM 2:45 PM **Assessing the Ability of DTRA SOM to Accurately Capture the Local Climatology in Regions of Complex Terrain**

Ciara Dorsay¹, Jonathan M. Vogel^{1,2}, and Jimmie Trigg²

¹ Applied Research Associates; ² Defense Threat Reduction Agency, Ft. Belvoir, VA

2:45 PM 3:00 PM **Lessons from DCNet and the Path Forward**

Bruce B. Hicks¹, Will R. Pendergrass², Ariel Stein²

¹ Metcorps, Norris, TN; ² National Oceanic and Atmospheric Administration/Air Resources Laboratory, College Park, MD

3:00 PM 3:15 PM **Influence of Roof Slope on Urban Flow with a Diagnostic Model**

Bruno RIBSTEIN¹, Maxime NIBART¹, Daniel Loeb¹, Patrick Armand²

¹ ARIA Technologies, France; ² CEA, France

3:15 PM

DAY 3 ADJOURNS

DAY 4 (November 5)

Jack Rabbit III Break-out Session

Chair: Ron Meris, Defense Threat Reduction Agency, Fort Belvoir, VA

10:00 AM 12:00 PM **Jack Rabbit III break-out session.**

All are welcome, i.e., registering for GMU conference is not required.

The break-out session will be on a SEPARATE Zoom connection, shown below.

(Note that this is NOT the link for the conference.)

Join ZoomGov Meeting

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