ADMLC

UK Atmospheric Dispersion Modelling Liaison Committee

Ingress of Pollutants into Buildings Forum

17 Oct 2013

PHE, Chilton, UK

http://www.admlc.org.uk

Agenda

Ingress of Pollutants into Buildings

10.30 - 10.45	**Rob Jordan**, Home Office The role of modelling in managing the impact of biological attacks
10.45 - 11.00	**James-Stewart-Evans**, PHE Protective actions in acute chemical and radiological incidents: evacuate or shelter-in-place?
11.00 - 11.30	**Vina Kukadia**, BR Ingress of external pollutants into urban buildings: a new methodology
11.30 - 11.50 – Break	
11.50 - 12.20	**Paul Linden,** University of Cambridge Wind-driven cross and single-sided ventilation of buildings: models and wind tunnel tests
12.20 - 12.50	**Steve Herring**, DSTL: Linking indoor and outdoor dispersion models to assess indoor hazards and protection from external releases
12.50 - 13.40 – Lunch	
13.40 - 14.10	**Josep Grau-Bove**, University College London CFD modelling and experimental study of the penetration and deposition of fine particulate matter in historic buildings
14.10 - 14.40	**Janet Barlow**, University of Reading The effect of urban flows on pollutant ingress into buildings – results from experiments in central London
14.40 - 15.00 – Break	
15.00 - 15.45	**Michael Sohn**, Lawrence Berkeley Laboratory Urban-Scale Indoor-Outdoor Hazard Assessment: Research Needs and Current Capabilities
15.45 - 16.15 – General discussion	

Summary

- Talks covered
  - Users, model developers and physical researchers
- Physical and numerical models range in complexity
- Interest arises from a range of applications
  - Energy efficiency
  - Occupant general comfort
  - Preservation of our heritage
  - Routine AQ
  - Event response
  - Event planning
  - etc

Summary

- The problem spans:
  - Source
  - Meteorology
  - Atmospheric dispersion
  - Building design
  - Building orientation
  - Surrounding environment
  - Internal geometry
- These cover wide range of scales
- Many model coupling issues/questions
- Uncertainties exist in evaluating models for all of these components
- Very limited data available for entire model chain evaluation

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Summary

- Considerable work undertaken and underway
  - This is in diverse fields e.g. building energy management, counter terrorism, etc and links/awareness present a challenge
  - Fields might benefit from effort to pull an overarching picture together
  - More physical and numerical work also clearly necessary
    - Covering components and entire modelling chain
- Model complexity must always be considered in terms of the purpose of the model
  - Numerical laboratory → Complex
  - Real time response → Simple
- What are the current sticking points in making advances in modelling?
  - Linked to what model end use is…
- Diverse application should direct developments/requirements
  - Different applications will have different questions, requirements, required/achievable accuracy, etc

Summary

- Model chains have many uncertainties/errors
  - Source position, strength, composition, …
  - Atmospheric conditions and interaction with buildings
  - Building data: air exchange rates, internal structure, exact external openings, …
  - Model physics
  - Receptor response
- Not possible to resolve
- Requires
  - Sensitivity analysis to assist in understanding
    - Identify components/processes required by differing applications
  - Probabilistic approach - necessary and desirable

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