

Contents

ROLE OF ATMOSPHERIC MODELS IN AIR POLLUTION POLICY AND ABATEMENT STRATEGIES

1. A Photochemical Screening Tool Based on a Scale Analysis of Ozone Photochemistry	3
B. Ainslie and D. G. Steyn	
2. Modeling and Analysis of Ozone and Nitrogen Oxides in the Southeast United States National Parks	13
V. P. Aneja, Q. Tong, D. Kang, and J. D. Ray	
3. An Investigation of Local Anthropogenic Effects on Photochemical Air Pollution in Istanbul with Model Study	20
U. Anteplioglu, S. Incecik, and S. Topcu	
4. Forecasting Urban Meteorology, Air Pollution and Population Exposure (European FUMAPEX Project).....	29
A. Baklanov, N. Bjergene, B. Fay, S. Finardi, A. Gross, M. Jantunen, J. Kukkonen, A. Rasmussen, A. Skouloudis, L. H. Slørdal, and R. S. Sokhi	
5. Models-3/CMAQ Simulations to Estimate Transboundary Influences on Ozone and Particulate Matter Concentrations Over Ontario in Spring–Summer 1998	41
An. Chtcherbakov, R. Bloxam, D. Yap, D. Fraser, N. Reid, and S. Wong	
6. Cost-Optimized Air Pollution Control Using High-Order Sensitivity Analysis	48
D. S. Cohan and A. G. Russell	
7. Seasonal Evaluation of EU Road Traffic Emission Abatement Strategies on Photochemical Pollution in Northern Italy	59
G. Finzi, V. Gabusi, and M. Volta	
8. Risk Based Approaches to Assessing the Environmental Burden of Acid Gas Emissions	68
B. Fisher	

9. Assessment of Different Land Use Development Scenarios in Terms of Traffic Flows and Associated Air Quality	77
F. Lefebvre, K. De Ridder, S. Adriaensen, L. Janssen, L. Int Panis, S. Vermoote, J. Dufek, A. Wania, J. Hirsch, C. Weber, and A. Thierry	
10. Concentrations of Toxic Air Pollutants in the U.S. Simulated by an Air Quality Model	87
D. J. Luecken and W. T. Hutzell	
11. A Numerical Study of Recirculation Processes in the Lower Fraser Valley (British Columbia, Canada).....	97
A. Martilli and D. G. Steyn	
12. A Preliminary Estimate of the Total Impact of Ozone and PM _{2.5} Air Pollution on Premature Mortalities in the United States	102
D. L. Mauzerall and Q. Tong	
13. Application of a Comprehensive Acid Deposition Model in Support of Acid Rain Abatement in Canada	109
M. D. Moran	
14. Modeling Source-Receptor Relationships and Health Impacts of Air Pollution in the United States.....	119
Q. Tong, D. Mauzerall, and R. Mendelsohn	

INTEGRATED REGIONAL MODELING

15. Evaluation of Local Ozone Production of Chamonix Valley (France) During a Regional Smog Episode	129
E. Chaxel, G. Brulfert, C. Chemel, and J.-P. Chollet	
16. Alternative Approaches to Diagnosing Ozone Production Regime.....	140
D. S. Cohan, Y. Hu, and A. G. Russell	
17. Analysis of Seasonal Changes of Atmospheric Aerosols on Different Scales in Europe Using Sequentially Nested Simulations.....	149
A. Ebel, M. Memmesheimer, E. Friese, H. J. Jakobs, H. Feldmann, C. Kessler, and G. Piekorz	
18. Interaction Between Meteorological and Dispersion Models at Different Scales	158
E. Genikhovich, M. Sofiev, and I. Gracheva	
19. Modeling Photochemical Pollution in the Northeastern Iberian Peninsula.....	167
P. Jiménez, O. Jorba, R. Parra, C. Pérez, and J. M. Baldasano	

20. Modeling the Weekend Effect in the Northeastern Iberian Peninsula	177
P. Jiménez, R. Parra, S. Gassó, and J. M. Baldasano	
21. Transport and Deposition Patterns of Ozone and Aerosols in the Mediterranean Region	187
G. Kallos, M. Astitha, F. Gofa, M. O'Connor, N. Mihalopoulos, and Z. Zlatev	
22. On the Formulation and Implementation of Urban Boundary Conditions for Regional Models	197
C. Mensink	
23. Computational Model for Transient Pollutants Dispersion in City Intersection and Comparison with Measurements	207
J. Pospisil and M. Jicha	

EFFECTS OF CLIMATE CHANGE ON AIR QUALITY

24. Air Quality in Future Decades – Determining the Relative Impacts of Changes in Climate, Emissions, Global Atmospheric Composition, and Regional Land Use	217
C. Hogrefe, B. Lynn, B. Solecki, J. Cox, C. Small, K. Knowlton, J. Rosenthal, R. Goldberg, C. Rosenzweig, K. Civerolo, J.-Y. Ku, S. Gaffin, and P. L. Kinney	
25. Calculated Feedback Effects of Climate Change Caused by Anthropogenic Aerosols.....	227
T. Iversen, J. E. Kristjánsson, A. Kirkevåg, and Ø. Seland	
26. Dimethyl Sulphide (DMS) and its Oxidation to Sulphur Dioxide Downwind of an Ocean Iron Fertilization Study, SERIES: A Model for DMS Flux	237
A. L. Norman, and M. A. Wadleigh	

AEROSOLS AS ATMOSPHERIC CONTAMINANTS

27. Aerosol Modelling with CAMX4 and PMCAMX: A Comparison Study.....	247
S. Andreani-Aksoyoglu, J. Keller, and A. S. H. Prévôt	
28. Source Apportionment of Primary Carbonaceous Aerosol Using the Community Multiscale Air Quality Model	257
P. V. Bhawe, G. A. Pouliot, and M. Zheng	
29. Urban Population Exposure to Particulate Air Pollution Induced by Road Transport	267
C. Borrego, O. Tchepel, A. M. Costa, H. Martins, and J. Ferreira	

30. Numerical Simulation of Air Concentration and Deposition of Particulate Metals Emitted from a Copper Smelter and a Coal Fired Power Plant During the 2000 Field Experiments on Characterization of Anthropogenic Plumes	277
S. M. Daggupaty, C. M. Banic, and P. Cheung	
31. Aerosol Production in the Marine Boundary Layer Due to Emissions from DMS: Study Based on Theoretical Scenarios Guided by Field Campaign Data	286
A. Gross and A. Baklanov	
32. Modelling the Atmospheric Transport and Environmental Fate of Persistent Organic Pollutants in the Northern Hemisphere using a 3-D Dynamical Model	295
K. M. Hansen, J. H. Christensen, J. Brandt, L. M. Frohn, and C. Geels	
33. PM-Measurement Campaign HOVERT: Transport Analysis of Aerosol Components by use of the CTM REM-CALGRID	303
A. Kerschbaumer, M. Beekmann, and E. Reimer	
34. Direct Radiative Forcing due to Anthropogenic Aerosols in East Asia During 21-25 April 2001	312
S.-U. Park and L.-S. Chang	
35. Modelling Fine Aerosol and Black Carbon over Europe to Address Health and Climate Effects	321
M. Schaap and P. J. H. Builtjes	
36. An Approach to Simulation of Long-Range Atmospheric Transport of Natural Allergens: An Example of Birch Pollen	331
P. Siljamo, M. Sofiev, and H. Ranta	
37. Cloud Chemistry Modeling: Parcel and 3D Simulations	340
A.-M. Sehili, R. Wolke, J. Helmert, M. Simmel, W. Schröder, and E. Renner	
38. A Test of Thermodynamic Equilibrium Models and 3-D Air Quality Models for Predictions of Aerosol NO_3^-	351
S. Yu, R. Dennis, S. Roselle, A. Nenes, J. Walker, B. Eder, K. Schere, J. Swall, and W. Robarge	

NEW DEVELOPMENTS

39. Comparison of Aggregated and Measured Turbulent Fluxes in an Urban Area	363
E. Batchvarova, S.-E. Gryning, M. W. Rotach, and A. Christen	
40. Ensemble Dispersion Modeling: "All for One, One for All!"	371
S. Galmarini	

41. Linking the ETA Model with the Community Multiscale Air Quality (CMAQ) Modeling System: Ozone Boundary Conditions	379
P. C. Lee, J. E. Pleim, R. Mathur, J. T. McQueen, M. Tsidulko, G. DiMego, M. Iredell, T. L. Otte, G. Pouliot, J. O. Young, D. Wong, D. Kang, M. Hart, and K. L. Schere	
42. Mixing in Very Stable Conditions	391
L. Mahrt and D. Vickers	
43. Air Quality Ensemble Forecast Over the Lower Fraser Valley, British Columbia	399
L. Delle Monache, X. Deng, Y. Zhou, H. Modzelewski, G. Hicks, T. Cannon, R. B. Stull, and C. di Cenzo	
44. Developments and Results from a Global Multiscale Air Quality Model (GEM-AQ)	403
L. Neary, J. W. Kaminski, A. Lupu, and J. C. McConnell	
45. A Variable Time-Step Alogrithm for Air Quality Models	411
M. T. Odman and Yongtao Hu	
46. Temporal Signatures of Observations and Model Outputs: Do Time Series Decomposition Methods Capture Relevant Time Scales?	421
P. S. Porter, J. Swall, R. Gillian, E. L. Gego, C. Hogrefe, A. Gilliland, J. S. Irwin, and S. T. Rao	
47. Wind Tunnel Study of the Exchange Between a Street Canyon and the External Flow	430
P. Salizzoni, N. Grosjean, P. Méjean, R. J. Perkins, L. Soulhac, and R. Vanliefferinge	
48. An Example of Application of Data Assimilation Technique and Adjoint Modelling to an Inverse Dispersion Problem Based on the ETEX Experiment	438
M. Sofiev and E. Atlaskin	
49. Micro-Swift-Spray (MSS): A New Modelling System for the Simulation of Dispersion at Microscale. General Description and Validation	449
G. Tinarelli, G. Brusasca, O. Oldrini, D. Anfossi, S. Trini Castelli, and J. Moussafir	
50. New Developments on RAMS-Hg Model	459
A. Voudouri and G. Kallos	
51. Adaptation of Analytic Diffusivity Formulations to Eulerian Grid Model Layers of Finite Thickness	468
R. J. Yamartino, J. Flemming, and R. M. Stern	
52. Particulate Matter Source Apportionment Technology (PSAT) in the CAMx Photochemical Grid Model	478
G. Yarwood, R. E. Morris, and G. M. Wilson	

MODEL ASSESSMENT AND VERIFICATION

53. Testing Physics and Chemistry Sensitivities in the U.S. EPA Community Multiscale Air Quality Modeling System (CMAQ).....	495
J. R. Arnold and R. L. Dennis	
54. Real-Time Regional Air Quality Modelling in Support of the ICARTT 2004 Campaign.....	505
V. S. Bouchet, S. Ménard, S. Gaudreault, S. Cousineau, R. Moffet, L.-P. Crevier, W. Gong, P. A. Makar, M. D. Moran, and B. Pabla	
55. High Time-Resolved Comparisons for In-Depth Probing of CMAQ Fine-Particle and Gas Predictions	515
R. L. Dennis, S. J. Roselle, R. Gilliam, and J. Arnold	
56. Sensitivity Analysis of the EUROS Model for the 2003 Summer Smog Episode in Belgium	525
F. Deutsch, S. Adriaensen, F. Lefebvre, and C. Mensink	
57. A Performance Evaluation of the 2004 Release of Models-3 CMAQ	534
B. K. Eder and S. Yu	
58. Objective Reduction of the Space-Time Domain Dimensionality for Evaluating Model Performance	543
E. Gégó, P. S. Porter, C. Hogrefe, R. Gilliam, A. Gilliland, J. Swall, J. Irwin, and S. T. Rao	
59. Cloud Processing of Gases and Aerosols in a Regional Air Quality Model (AURAMS): Evaluation Against Aircraft Data	553
W. Gong, V. S. Bouchet, P. A. Makar, M. D. Moran, S. Gong, and W. R. Leaitch	
60. Evaluation of an Annual Simulation of Ozone and Fine Particulate Matter over the Continental United States – Which Temporal Features are Captured?.....	562
C. Hogrefe, J. M. Jones, A. Gilliland, P. S. Porter, E. Gégó, R. Gilliam, J. Swall, J. Irwin, and S. T. Rao	
61. Evaluation of CMAQ PM Results Using Size-resolved Field Measurement Data: The Particle Diameter Issue and Its Impact on Model Performance Assessment	571
W. Jiang, E. Giroux, H. Roth, and D. Yin	
62. The U.K. Met Office’s Next-Generation Atmospheric Dispersion Model, NAME III	580
A. Jones, D. Thomson, M. Hort, and B. Devenish	

63. An Operational Evaluation of ETA-CMAQ Air Quality Forecast Model	590
D. Kang, B. K. Eder, R. Mathur, S. Yu, and K. L. Schere	
64. AURAMS/Pacific2001 Measurement Intensive Comparison	599
P. A. Makar, V. S. Bouchet, W. Gong, M. D. Moran, S. Gong, A. P. Dastoor, K. Hayden, H. Boudries, J. Brook, K. Strawbridge, K. Anlauf, and S. M. Li	
65. Analyzing the Validity of Similarity Theories in Complex Topographies.....	608
O. L. L. Moraes, O. Acevedo, C. A. Martins, V. Anabor, G. Degrazia, R. da Silva, and D. Anfossi	
66. Siting and Exposure of Meteorological Instruments at Urban Sites.....	615
T. R. Oke	
67. The Effect of the Street Canyon Length on the Street Scale Flow Field and Air Quality: A Numerical Study	632
I. Ossanlis, P. Barmpas, and N. Moussiopoulos	
68. Limitations of Air Pollution Episodes Forecast due to Boundary-Layer Parameterisations Implemented in Mesoscale Meteorological Models.....	641
L. H. Slørdal, S. Finardi, E. Batchvarova, R. S. Sokhi, E. Fragkou, and A. D'Allura	

POSTERS

ROLE OF ATMOSPHERIC MODELS IN AIR POLLUTION POLICY AND ABATEMENT STRATEGIES

69. Use of Lagrangian Particle Model Instead of Gaussian Model for Radioactive Risk Assessment in Complex Terrain.....	653
M. Z. Božnar, and P. Mlakar	
70. Study of Air Pollutant Transport in Northern and Western Turkey	656
T. Kindap, A. Unal, S.-H. Chen, Y. Hu, T. Odman, and M. Karaca	
71. Source Term Assessment from Off-Site Gamma Radiation Measurements	659
B. Lauritzen and M. Drews	
72. Determination of the Impact of Different Emission Sources in the Air Quality Concentrations: The Teap Tool.....	662
R. San José, J. L. Pérez, and R. M. González	
73. Advanced Atmospheric Dispersion Modelling and Probabilistic Consequence Analysis for Radiation Protection Purposes in Germany	664
H. Thielen, W. Brücher, R. Martens, and M. Sogalla	

INTEGRATED REGIONAL MODELING

74. Comparison of Different Turbulence Models Applied to Modelling of
Airflow in Urban Street Canyon and Comparison with Measurements 669
M. Jicha and J. Pospisil
75. Pollutant Dispersion in a Heavily Industrialized Region: Comparison
of Different Models 671
M. R. Soler, S. Ortega, C. Soriano, D. Pino, and M. Alarcón
76. Study of Odor Episodes Using Analytical and Modeling Approaches 674
C. Soriano, F. X. Roca, and M. Alarcón
77. Application of Back-Trajectory Techniques to the Characterization
of the Regional Transport of Pollutants to Buenos Aires, Argentina 677
A. G. Ulke

EFFECTS OF CLIMATE CHANGE ON AIR QUALITY

78. Application of Source-Receptor Techniques to the Assessment
of Potential Source Areas in Western Mediterranean 683
M. Alarcón, A. Avila, X. Querol, and M. Rosa Soler

NEW DEVELOPMENTS

79. Influence of the Autocorrelation Function in the Derivation of Fundamental
Relationship $\varepsilon \propto \sigma_v^2 / C_0 T_{Lv}$ 689
G. A. Degrazia, O. C. Acevedo, J. C. Carvalho, A. G. Goulart,
O. L. L. Moraes, H. F. Campos Velho, and D. M. Moreira
80. A Model for Describing the Evolution of the Energy Density Spectrum
in the Convective Boundary Layer Growth 692
A. Goulart, H. F. C. Velho, G. Degrazia, D. Anfossi, O. Acevedo,
O. L. L. Moraes, D. Moreira, and J. Carvalho
81. Simulation of the Dispersion of Pollutants Considering Nonlocal Effects
in the Solution of the Advection-Diffusion Equation 695
D. M. Moreira, C. Costa, M. T. Vilhena, J. C. Carvalho, G. A. Degrazia,
and A. Goulart
82. Concentration Fluctuations in Turbulent Flow 698
L. Mortarini and E. Ferrero

MODEL ASSESSMENT AND VERIFICATION

83. Skill's Comparison of Three Canadian Regional Air Quality Models Over Eastern North America for the Summer 2003	703
D. Dégardin, V. Bouchet, and L. Neary	
84. Region-Based Method for the Verification of Air Quality Forecasts	708
S. Gaudreault, L.-P. Crevier, and M. Jean	
85. On the Comparison of Nesting of Lagrangian Air-Pollution Model Smog to Numerical Weather Prediction Model ETA and Eulerian CTM CAMX to NWP Model MM5: Ozone Episode Simulation	711
T. Halenka, K. Eben, J. Brechler, J. Bednar, P. Jurus, M. Belda, and E. Pelikan	
86. High Resolution Air Quality Simulations with MC2-AQ and GEM-AQ	714
J. W. Kamiński, L. Neary, A. Lupu, J. C. McConnell, J. Strużewska, M. Zdunek, and L. Łobocki	
87. Nonlinear Models to Forecast Ozone Peaks	721
C. Novara, M. Volta, and G. Finzi	
88. Evaluation of MC2 Profile Data During the Pacific2001 Field Study	724
B. J. Snyder and X. Qiu	
List of Participants	727