

Springer Atmospheric Sciences

Theodore S. Karacostas  
Alkiviadis F. Bais  
Panagiotis T. Nastos *Editors*

# Perspectives on Atmospheric Sciences

 Springer

**Springer Atmospheric Sciences**

More information about this series at <http://www.springer.com/series/10176>

Theodore S. Karacostas · Alkiviadis F. Bais  
Panagiotis T. Nastos  
Editors

# Perspectives on Atmospheric Sciences

 Springer

*Editors*

Theodore S. Karacostas  
Department of Meteorology and  
Climatology  
Aristotle University of Thessaloniki  
Thessaloniki  
Greece

Panagiotis T. Nastos  
Department of Geography and Climatology  
University of Athens  
Athens  
Greece

Alkiviadis F. Bais  
Department of Applied and Environmental  
Physics  
Aristotle University of Thessaloniki  
Thessaloniki  
Greece

ISSN 2194-5217

Springer Atmospheric Sciences

ISBN 978-3-319-35094-3

DOI 10.1007/978-3-319-35095-0

ISSN 2194-5225 (electronic)

ISBN 978-3-319-35095-0 (eBook)

Library of Congress Control Number: 2016940886

© Springer International Publishing Switzerland 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

This Springer imprint is published by Springer Nature  
The registered company is Springer International Publishing AG Switzerland

# Preface

The 13th International Conference on Meteorology, Climatology and Atmospheric Physics (COMECAP 2016) is organized on a biennial basis, holding a long history of 24 years, dating back to 1992. This year the conference is organized by the Department of Meteorology and Climatology, School of Geology and the Laboratory of Atmospheric Physics, School of Physics, Aristotle University of Thessaloniki, in collaboration with the Hellenic Meteorological Society and the Mariolopoulos—Kanaginis Foundation for the Environmental Sciences. The conference is to be held on September 19–21, 2016 in Thessaloniki, hosted by the Aristotle University Research Dissemination Center.

The conference aims to present state-of-the-art scientific developments, methodologies, modeling tools, theoretical approaches, and measurements, while acting as a forum for discussion and debate on disciplines that attract the interest of the international scientific community. Moreover, it provides the opportunity for the dissemination of new knowledge in the framework of Meteorology, Climatology, and Atmospheric Physics, hosting invited keynote speakers, experts, scientists, and mainly early-career scientists to present and promote their recent scientific research studies and share their innovative ideas. Finally, it contributes to strengthening the bonds among the members of the Greek and the international scientific community.

COMECAP 2016 covers various topics related to the Atmospheric Sciences, which is in fact an interdisciplinary field, providing the opportunity to understand the physical notions of Meteorology, Climatology, and Atmospheric Physics in an integrated manner. The papers presented at the COMECAP 2016 cover a broad spectrum of topics that include Atmospheric Numerical Modeling, Synoptic and Dynamic Meteorology, Applied Meteorology and Climatology, Remote Sensing, Satellite Meteorology, Agricultural Meteorology and Climatology, Weather Analysis and Forecasting, Extreme Weather Events, Weather Modification, Aerosols, Stratospheric Ozone, Air Pollution and Air Quality, Atmospheric Radiation, Atmospheric Chemistry, Climate Dynamics, and Climatic Changes.

A total of 179 full papers are finally accepted for publication at the conference proceedings after peer review conducted, mainly by the members of the scientific committee. The published papers in this two-volume book are grouped into three main sections, as reflected in the title of the conference: 61 papers in Meteorology, 48 in Climatology, and 70 in Atmospheric Physics.

It is our pleasure and privilege to acknowledge the contribution of the authors, the members of the organizing committee, the members of the scientific committee and the extra appointed reviewers, and especially the chairpersons of the review scientific committees, who have ensured that all publications meet the scientific standards of COMECAP 2016. Special thanks also go to Mr. Ioannis Tegoulas, who has additionally undertaken all the paper editing.

Publication of the COMECAP 2016 Conference Proceedings would not be possible without the generosity of our sponsors. We express our deepest thanks for their support.

Thessaloniki, Greece

Theodore S. Karacostas  
Akliviadis F. Bais

# **Address of the Hellenic Meteorological Society (HMS)**

The Hellenic Meteorological Society, member of the European Meteorological Society, proudly presents the Proceedings of the International Conference on Meteorology, Climatology and Atmospheric Physics (COMECAP 2016), in collaboration with the Department of Meteorology and Climatology, School of Geology, Aristotle University of Thessaloniki, the Laboratory of Atmospheric Physics, School of Physics, Aristotle University of Thessaloniki and the Mariolopoulos—Kanaginis Foundation for the Environmental Sciences.

The accepted scientific papers are published, after peer revision, in Springer book series under the title “Perspectives on Atmospheric Sciences.” This fact improves the level of the conference as far as the quality of presentations and the dissemination of recent knowledge of our climate system from regional to global scale are concerned.

The Hellenic Meteorological Society has co-organized the previous biennial conferences in Thessaloniki (May 21–23, 1992 and September 29–30, 1994), Athens (September 25–27, 1996 and September 22–25, 1998), Thessaloniki (September 28–30, 2000), Ioannina (September 25–28, 2002), Nicosia (September 28–30, 2004), Athens (May 24–26, 2006), Thessaloniki (May 28–31, 2008), Patras (May 25–28, 2010), Athens (May 29–June 1, 2012), and Heraklion (May 28–31, 2014). All these conferences have been carried out by the members of the Hellenic Meteorological Society and our international colleagues from disciplines associated with the study of atmospheric environment.

The achievement of COMECAP 2016 is due to the great efforts of the organizing committee towards the success and quality of the conference, as well as the sponsors, who granted this scientific event.

The Hellenic Meteorological Society wishes to express its gratitude to everybody mentioned and the participants, who presented their scientific papers, contributing to the better understanding of the physical processes of our climate system.

Prof. Panagiotis T. Nastos  
The President of the Hellenic Meteorological Society



# Organizing Committee

## Chairman

**Theodore S. Karacostas**, Professor, Aristotle University of Thessaloniki

## Vice Chairman

**Panagiotis T. Nastos**, Professor, University of Athens, President of the Hellenic Meteorological Society

## Executive Secretariat

**Eleni Katragkou**, Assistant Professor, Aristotle University of Thessaloniki

**Ioannis Tegoulis**, Aristotle University of Thessaloniki

**Stergios Kartsios**, Aristotle University of Thessaloniki

## Treasurer

**Prodromos Zanis**, Associate Professor, Aristotle University of Thessaloniki

**Dimitrios Bampzelis**, Aristotle University of Thessaloniki

## **HMS Members**

**Athanasios G. Paliatsos**, Professor, Technological Education Institute of Piraeus

**Dimitra Founda**, Senior Researcher, National Observatory of Athens

**Ioannis T. Matsangouras**, Head of Satellites and Radars Department, Hellenic National Meteorological Service

**Larissi Ioanna**, Research Assistant, Technological Education Institute of Piraeus

# Scientific Committee

## Chairman

**Alkiviadis F. Bais**, Professor, Aristotle University of Thessaloniki

## Vice Chairman

**Charalambos Feidas**, Associate Professor, Aristotle University of Thessaloniki

## Review Committee

### Meteorology

**Prodromos Zanis**, Associate Professor, Aristotle University of Thessaloniki

**Theodore Mavrommatis**, Associate Professor, Aristotle University of Thessaloniki

**Ioannis Pytharoulis**, Assistant Professor, Aristotle University of Thessaloniki

### Climatology

**Christina Anagnostolpoulou**, Assistant Professor, Aristotle University of Thessaloniki

**Konstandia Tolika**, Assistant Professor, Aristotle University of Thessaloniki

**Kleareti Tourpali**, Assistant Professor, Aristotle University of Thessaloniki

## Atmospheric Physics

**Dimitrios Melas**, Professor, Aristotle University of Thessaloniki

**Dimitrios Balis**, Associate Professor, Aristotle University of Thessaloniki

**Charikleia Meleti**, Assistant Professor, Aristotle University of Thessaloniki

## Members

- Amiridis V., Senior Researcher, National Observatory of Athens, Greece
- Anadranistakis E., Department Head, Hellenic National Meteorological Service, Greece
- Argiriou A., Professor, University of Patras, Greece
- Avgoustoglou E., Department Head, Hellenic National Meteorological Service, Greece
- Bais A.F., Professor, Aristotle University of Thessaloniki, Greece
- Balaras C., Research Director, National Observatory of Athens, Greece
- Balis D., Associate Professor, Aristotle University of Thessaloniki, Greece
- Baltas E., Professor, National Technical University of Athens, Greece
- Bartzokas A., Associate Professor, University of Ioannina, Greece
- Batchvarova E., Professor, National Institute of Meteorology and Hydrology, Sofia, Bulgaria
- Bednorz E., Professor, Climatology Department, Adam Mickiewicz University, Poznan, Poland
- Beniston M., Professor, University of Geneva, Switzerland
- Boland J., Associate Professor, University of South Australia, Australia
- Burrows J.P., Professor, University of Bremen, Germany
- Curic M., Professor, University of Belgrade, Faculty of Physics, Institute of Meteorology, Serbia
- Feidas H., Associate Professor, Aristotle University of Thessaloniki, Greece
- Flocas H.A., Associate Professor, University of Athens, Greece
- Founda D., Senior Researcher, National Observatory of Athens, Greece
- Gerasopoulos E., Research Director, National Observatory of Athens, Greece
- Giannakopoulos C., Research Director, National Observatory of Athens, Greece
- Hadjimitsis D., Associate Professor, Cyprus University of Technology, Cyprus
- Hatzianastassiou N., Associate Professor, University of Ioannina, Greece
- Kalabokas P., Research Director, Academy of Athens, Greece
- Kallos G., Professor, University of Athens, Greece
- Kambezidis H., Research Director, National Observatory of Athens, Greece
- Kanakidou M., Professor, University of Crete, Greece
- Karacostas T.S., Professor, Aristotle University of Thessaloniki, Greece
- Kassomenos P., Professor, University of Ioannina, Greece
- Kazadzis S., Senior Researcher, National Observatory of Athens, Greece
- Kazantzidis A., Associate Professor, University of Patras, Greece
- Kerkidis P., Professor, Agricultural University of Athens, Greece

- Kolydas Th., Deputy Director, Hellenic National Meteorological Service, Greece
- Kotroni V., Research Director, National Observatory of Athens, Greece
- Kouroutzoglou I., Department Head, Hellenic National Meteorological Service, Greece
- Kourtidis K., Associate Professor, University of Thrace, Greece
- Koussis A., Research Director, National Observatory of Athens, Greece
- Koutsoyiannis D., Professor, National Technical University of Athens, Greece
- Krestenitis Y., Professor, Civil Engineering, Aristotle University of Thessaloniki, Greece
- Krol M., Professor, University of Wageningen, The Netherlands
- Kutiel H., Professor, University of Haifa, Israel
- Lagouvardos K., Research Director, National Observatory of Athens, Greece
- Lazaridis M., Professor, Technical University of Crete, Greece
- Lelieveld J., Professor, Cyprus Institute, Cyprus, Max Planck Institute, Germany
- Lionello P., Associate Professor, University of Lecce, Italy
- Luterbacher J., Professor, Liebig University of Giessen, Germany
- Matsangouras I.T., Department Head, Hellenic National Meteorological Service, Greece
- Matzarakis A., Head Human-Biometeorology, German Weather Service, Germany
- Melas D., Professor, University of Thessaloniki, Greece
- Michaelides S., Director, Cyprus Weather Service, Cyprus
- Michalakakou G., Professor, University of Ioannina, Greece
- Mihalopoulos N., Director, IERSD, National Observatory of Athens, Greece
- Mousiopoulos N., Professor, LHTEE, Aristotle University of Thessaloniki, Greece
- Nastos P., Professor, University of Athens, Greece
- Nenes A., Professor, Georgia Institute of Technology, USA
- Paliatsos A.G., Professor, Technological Education Institute of Piraeus, Greece
- Pandis S., Professor, University of Patras, Greece
- Papadopoulos A., Senior Researcher, Hellenic Centre for Marine Research, Greece
- Papamichail D., Professor, School of Agriculture, Aristotle University of Thessaloniki, Greece
- Papayannis A., Professor, National Technical University of Athens, Greece
- Philandras C., Senior Researcher, Academy of Athens, Greece
- Pilinis C., Professor, University of Aegean, Greece
- Psiloglou B., Senior Researcher, National Observatory of Athens, Greece
- Retalis A., Senior researcher, National Observatory of Athens, Greece
- Santamouris M., Professor, University of Athens, Greece
- Spiridonov, V., Associate Professor, St. Cyril and Methodius University, Institute of Physics, FYROM
- Stephanou E., Professor, University of Crete, Greece
- Tsonis A., Professor, University of Wisconsin-Milwaukee, USA

- Tombrou M., Associate Professor, University of Athens, Greece
- Triantafyllou A., Professor, Technological Education Institute of West Macedonia, Greece
- Tsigaridis K., Associate Researcher, Columbia University and NASA-GISS, USA
- Tsiligiridis G., Professor, Mechanical Engineering, Aristotle University of Thessaloniki, Greece
- Tsiros J., Associate Professor, Agricultural University of Athens, Greece
- Vardavas I., Associate Professor, University of Crete, Greece
- Varotsos C., Professor, University of Athens, Greece
- Voudouri A., Department Head, Hellenic National Meteorological Service, Greece
- Xoplaki E., Justus-Liebig-University Giessen, Germany
- Yenigün O., Professor, Institute of Environmental Sciences, Bogaziçi University, Istanbul, Turkey
- Zanis P., Associate Professor, University of Thessaloniki, Greece
- Zerefos C.S., Professor, Academician, Academy of Athens, Greece
- Ziomas I., Professor, National Technical University of Athens, Greece
- Zoumakis E., Professor, Technological Education Institute of Thessaloniki, Greece

# Contents

## Part I Meteorology

<b>The Influence of WRF Parameterisation Schemes on High Resolution Simulations Over Greece</b> . . . . .	3
I. Tegoulis, S. Kartsios, I. Pytharoulis, S. Kotsopoulos and Theodore S. Karacostas	
<b>Assessing the Sensitivity of COSMO/GR Atmospheric Model to Effectively Simulate the Influence of Diabatic Heating on Eastern Mediterranean Explosive Cyclogenesis Under Different Parameterizations of the Model Physics</b> . . . . .	9
J. Kouroutzoglou, E. Avgoustoglou, H.A. Flocas, M. Hatzaki, P. Skrimizeas, A. Lalos, K. Keay and I. Simmonds	
<b>Evaluation of WRF Parameterization Schemes During Heat-Wave Events Over the Greater Area of South–East Mediterranean</b> . . . . .	17
C. Giannaros, D. Melas and T.M. Giannaros	
<b>A Study of an Extreme Hot Weather Event in Greece with the WRF-ARW Atmospheric Model</b> . . . . .	25
G. Emmanouil, D. Vlachogiannis, A. Sfetsos, S. Karozis and A. Tasopoulou	
<b>Lightning Forecasting in Europe: Results Obtained from One Year of Operational Simulations</b> . . . . .	33
T.M. Giannaros, V. Kotroni and K. Lagouvardos	
<b>Numerical Simulations and Observational Study of a Mesoscale Convective System in France, During the HyMeX—SOP1 Using the WRF Model</b> . . . . .	41
S. Dafis, K. Lagouvardos, V. Kotroni, T.M. Giannaros and A. Bartzokas	

<b>Design and Evaluation of Sensitivity Tests of COSMO Model Over the Mediterranean Area</b> . . . . .	49
E. Avgoustoglou, A. Voudouri, P. Khain, F. Grazzini and J.M. Bettems	
<b>Comparison and Validation of WRF Model Physics Parameterizations Over the Domain of Greece.</b> . . . . .	55
N. Politi, P.T. Nastos, A. Sfetsos, D. Vlachogiannis, N.R. Dalezios, N. Gounaris, M.R. Cardoso and M.M.P. Soares	
<b>Severe Weather Events and Sea Level Variability Over the Mediterranean Sea: The WaveForUs Operational Platform</b> . . . . .	63
Y. Krestenitis, I. Pytharoulis, Theodore S. Karacostas, Y. Androulidakis, C. Makris, K. Kombiadou, I. Tegoulis, V. Baltikas, S. Kotsopoulos and S. Kartsios	
<b>The Implementation of a Dust Wet Deposition Scheme in the WRF-CHEM Model</b> . . . . .	69
K. Tsarpalis, A. Papadopoulos and P. Katsafados	
<b>Temperature Seasonal Predictability of the WRF Model.</b> . . . . .	75
G. Varlas, P. Katsafados and A. Papadopoulos	
<b>Numerical Modeling of a Tornado Event at Skala, Lakonia, Peloponnese in September 2015.</b> . . . . .	81
M.P. Mylonas, P.T. Nastos and Ioannis T. Matsangouras	
<b>Towards Predictability Limit: Advancing the Deterministic Skill of Ensembles</b> . . . . .	87
I. Kioutsioukis	
<b>Marine Boundary Layer Offshore and Coastal Coupled Simulations.</b> . . . . .	93
C. Stathopoulos, G. Galanis and G. Kallos	
<b>Observational and Numerical Study of a Tornado Outbreak in Attica and Euboea</b> . . . . .	99
A. Lampiris, S. Dafis and G. Papavasileiou	
<b>The Effect of Surface Heterogeneity on the Vertical Structure of the Saharan Convective Boundary Layer.</b> . . . . .	107
G. Papangelis, M. Tombrou and J. Kalogiros	
<b>Numerical Study of the Medicane of November 2014</b> . . . . .	115
I. Pytharoulis, Ioannis T. Matsangouras, I. Tegoulis, S. Kotsopoulos, Theodore S. Karacostas and P.T. Nastos	
<b>Numerical Modeling Analysis of Tornadoes Using the COSMO.GR Model Over Greece.</b> . . . . .	123
Ioannis T. Matsangouras, E. Avgoustoglou, F. Gofa, I. Pytharoulis, P.T. Nastos and H.W. Bluestein	



**Performance of RegCM4 Model During Heat Waves—A Case Study for China** . . . . . 129  
 D.K. Papanastasiou, X. Huang, A. Poupkou, X. Pu, P. Zanis, T. Wang and D. Melas

**The Role of Heat Extinction Depth Concept to Fire Behavior: An Application to WRF-SFIRE Model.** . . . . . 137  
 S. Kartsios, Theodore S. Karacostas, I. Pytharoulis and A.P. Dimitrakopoulos

**Impacts of Observational Data Assimilation on Operational Forecasts** . . . . . 143  
 A. Voudouri, E. Avgoustoglou and P. Kaufmann

**Comparative Forecasts of a Local Area Model (WRF) in Summer for Cyprus** . . . . . 151  
 F. Tymvios, D. Charalambous, J. Lelieveld and S. Michaelides

**Implementation of a Hybrid Surface Layer Parameterization Scheme for the Coupled Atmosphere-Ocean Wave System WEW** . . . . . 159  
 P. Katsafados, G. Varlas, A. Papadopoulos and G. Korres

**Development and Implementation of a Soil Moisture Perturbation Method for EPS Initial Conditions.** . . . . . 167  
 P. Louka, F. Gofa, C. Marsigli and A. Montani

**The Impact of Cyclone Xaver on Hydropower Potential in Norway** . . . . . 175  
 I. Cheliotis, G. Varlas and K. Christakos

**Heavy Convective Rainfall Forecast Over Paraguay Using Coupled WRF-Cloud Model** . . . . . 183  
 V. Spiridonov, J. Baez and B. Telenta

**The Heat Health Warning System of DWD—Concept and Lessons Learned** . . . . . 191  
 A. Matzarakis

**Impact of Storm Seeding to Hailstone Features in Central Macedonia** . . . . . 197  
 D. Foris and V. Foris

**Validating SAF NWC Products Over the Greek Area.** . . . . . 203  
 A. Karagiannidis, K. Lagouvardos, V. Kotroni and T.M. Giannaros

**Use of Global Precipitation Measurement’s Satellite Data for the Study of a Mesoscale Convective System.** . . . . . 209  
 D. Mitropoulos and H. Feidas

<b>Flash Flood Risk and Vulnerability Analysis in Urban Areas: The Case of October 22, 2015, in Attica, Greece. . . . .</b>	217
K. Papagiannaki, V. Kotroni, K. Lagouvardos and A. Bezes	
<b>The First Joint Hydro-Meteo Warnings in Croatia During Heavy Rainfall Period in October 2015 . . . . .</b>	225
P. Mutic, T. Jurlina, T. Vujnovic, D. Oskorus, N. Strelec-Mahovic and T. Renko	
<b>A Total Weighted Least Squares Method for the Determination of the Meteoric Water Line of Precipitation for Hydrological Purposes . . . . .</b>	233
A.A. Argiriou, V. Salamalikis and E. Dotsika	
<b>Storm Characteristics Over Central Macedonia and Thessaly and Their Relation to Atmospheric Parameters. . . . .</b>	239
E. Chatzi	
<b>Radar Climatology of Supercell Thunderstorms in Northern and Central Greece. . . . .</b>	247
M. Christodoulou and M. Sioutas	
<b>Comparison of Physically and Image Based Atmospheric Correction Methods for Sentinel-2 Satellite Imagery . . . . .</b>	255
G. Lantzanakis, Z. Mitraka and N. Chrysoulakis	
<b>First Rains as Extreme Events Influencing Marine Primary Production . . . . .</b>	263
D. Kotta, D. Kitsiou and P. Kassomenos	
<b>Hail Characteristics and Cloud Seeding Effect for Hail Suppression in Central Macedonia, Greece. . . . .</b>	271
M. Sioutas	
<b>Satellite Rainfall Error Analysis with the Use of High-Resolution X-Band Dual-Polarization Radar Observations Over the Italian Alps. . . . .</b>	279
M.N. Anagnostou, J. Kalogiros, E. Nikolopoulos, Y. Derin, E.N. Anagnostou and M. Borga	
<b>The DAPHNE Conceptual Model for Designing a Precipitation Enhancement Project in Thessaly, Greece . . . . .</b>	287
Theodore S. Karacostas, I. Pytharoulis, I. Tegoulas, D. Bampzelis, S. Kartsios, S. Kotsopoulos, P. Zanis, E. Katragkou and K. Tympanidis	
<b>Watershed Size, an Alternative or a Misguided Parameter for River's Waterpower? Implementation in Macedonia, Greece . . . . .</b>	295
G. Grimpylakos, K. Albanakis and Theodore S. Karacostas	

**Survey of the Severe Hailstorms During Summer 2014 in the Northern Part of Greece** . . . . . 303  
 P. Fragkouli, A. Tyraski and K. Lagouvardos

**Assessment of the Thermal Comfort Conditions in a University Campus Using a 3D Microscale Climate Model, Utilizing Mobile Measurements** . . . . . 309  
 P.T. Nastos, K.P. Moustris, I. Charalampopoulos, I.K. Larissi and Athanasios G. Paliatsos

**Diurnal Distribution of Storm Characteristics in Central Macedonia During the Warm Season of the Year Using a C-Band Weather Radar** . . . . . 317  
 D. Bampzelis and Theodore S. Karacostas

**Rain Enhancement Feasibility Potential of Orographic Clouds Over Northern Greece.** . . . . . 323  
 K. Tympanidis, Theodore S. Karacostas and D. Bampzelis

**A Preliminary Study on the Effect of Rainfall Events on Human Thermal Comfort Under Hot Weather Conditions** . . . . . 329  
 I. Charalampopoulos and I. Tsiros

**One Day-Ahead Prognosis of Energy Demand Using Artificial Intelligence and Biometeorological Indices** . . . . . 335  
 D. Zafirakis, K.P. Moustris, D.H. Alamo and R.J. Nebot Medina

**The Effect of Rainfall Intensity on the Flood Generation of Mountainous Watersheds (Chalkidiki Prefecture, North Greece).** . . . . . 341  
 A. Kastridis and D. Stathis

**Air Temperature Estimation Over the Ainos Mountain, Kefallinia Island Using Linear Regression Analysis** . . . . . 349  
 S. Maniatis, A. Kamoutsis, A. Chronopoulou-Sereli and P.T. Nastos

**Dust Over the Area of the East Mediterranean: The Severe Dust Event of the Period 7–12 September 2015. Synoptic and Dynamic Analysis.** . . . . . 355  
 K. Nicolaidis and F. Tymvios

**On the Dynamics Underlying the Emergence of Coherent Structures in Barotropic Turbulence** . . . . . 361  
 N.A. Bakas, N.C. Constantinou and P.J. Ioannou

**Structure and Stability of Low Amplitude Jet Equilibria in Barotropic Turbulence.** . . . . . 369  
 N.C. Constantinou, P.J. Ioannou and N.A. Bakas

<b>Transient Growth of Ageostrophic Perturbations in a Baroclinic Shear Flow</b> . . . . .	377
S.C. Pateras and N.A. Bakas	
<b>Relationship Between Atmospheric Rivers and Extreme Precipitation Events</b> . . . . .	385
M. Martinković, N. Strelec Mahović, P. Mikuš Jurković, T. Renko, I. Pelajić and I. Smiljanić	
<b>Seasonal Synoptic Characteristics of Heavy Rain Events in the Attica Region</b> . . . . .	391
E. Feloni, P.T. Nastos and Ioannis T. Matsangouras	
<b>Comparison of the Synoptic Environment and Mechanisms of Two Cases of Surface Cyclogenesis in Greek Area Associated to Strong Low-Level Cold Surges</b> . . . . .	397
H. Karvelis, J. Kouroutzoglou, H.A. Flocas, M. Hatzaki, K. Tsioutra, A. Lalos, K. Keay, I. Simmonds and G. Katavoutas	
<b>Cyclone Occurrence and Lightning Distribution Over Mediterranean</b> . . . . .	403
E. Galanaki, E. Flaounas, K. Lagouvardos and V. Kotroni	
<b>24-h Ahead Wind Speed Prediction for the Optimum Operation of Hybrid Power Stations with the Use of Artificial Neural Networks</b> . . . . .	409
K.P. Moustris, D. Zafirakis, D.H. Alamo, R.J. Nebot Medina and J.K. Kaldellis	
<b>Identifying the Skill of Higher Resolution Precipitation Forecasts with Neighborhood Verification Techniques</b> . . . . .	415
F. Gofa, P. Louka, H.A. Flocas and A. Paraskevas	
<b>Towards a Study of Different Types of Extreme Wind Speed Conditions</b> . . . . .	421
P. Patlakas, D. Diamantis, G. Galanis and G. Kallos	
<b>Deucalion: Modern Educational Tools for Precaution Measures During Extreme Weather Events</b> . . . . .	429
K. Georgopoulos, E.E. Houssos, A. Gkikas, C.D. Papadimas, C.J. Lolis and A. Bartzokas	
<b>Part II Climatology</b>	
<b>Homogenization of Long-Term Time-Series of Temperature Records in Cyprus</b> . . . . .	437
M. Kezoudi and F. Tymvios	

**Atmospheric Circulation Characteristics Favoring Extreme Minimum Air Temperature Values Over the Greater Mediterranean Region . . . .** 443  
 P.V. Spyropoulou and A. Bartzokas

**Filling Missing Data in Target-Point Wind Speed Time Series . . . . .** 449  
 K. Kolokythas and A.A. Argiriou

**The Evolution of Etesians: Trends in 20th Century and Future Projections . . . . .** 455  
 I. Logothetis, K. Tourpali and S. Misios

**Analysis of the Synoptic Conditions of the Extreme Rainfall Heights of 2014 in Thessaloniki . . . . .** 463  
 K. Tolika, C. Anagnostolpoulou and P. Maheras

**Merominia. An Investigation of Their Scientific Basis . . . . .** 469  
 K.S. Patsiarika and A. Bartzokas

**Temporal and Spatial Trends of the Standardized Precipitation Index (SPI) in Greece Using Observations and Output from Regional Climate Models. . . . .** 475  
 E. Kostopoulou, C. Giannakopoulos, D. Krapsiti and A. Karali

**High-Resolution Simulations of Recent Past Extreme Precipitation Events Over Cyprus . . . . .** 483  
 G. Zittis, P. Hadjinicolaou, A. Bruggeman, C. Camera and J. Lelieveld

**Annual and Monthly Precipitation Variability in the Ionian Islands Using 16-Year TRMM Data . . . . .** 491  
 S. Kolios and A. Kalimeris

**Atmospheric Circulation Characteristics Favoring Wet Season Prolonged Spatially Extended Dry Spells in Greece . . . . .** 497  
 E.E. Houssos, A. Fotiadi and C.J. Lolis

**A 50-Year Climatology of Sea-Surface Response to Atmospheric Circulation Anomalies in the Mediterranean and the Black Seas During Summer . . . . .** 503  
 F.P. Dourou, V.P. Papadopoulos, C.J. Lolis and A. Bartzokas

**Spatial Analysis of the Air Temperature in Greece for the Normal Period 1971–2000 . . . . .** 509  
 M. Anadranistakis, A. Mamara and A.A. Argiriou

**Study of Cold Anticyclones Generating in the Mediterranean . . . . .** 515  
 M. Hatzaki, E. Bitsa, H.A. Flocas, J. Kouroutzoglou, L. Garde and I. Simmonds

<b>Annual and Seasonal Extreme Precipitation Probability Distributions at Thessaloniki Based Upon Hourly Values . . . . .</b>	521
M. Douka, Theodore S. Karacostas, E. Katragkou and C. Anagnostolpoulou	
<b>A Climatological Analysis of Potential Vorticity Over Greater Athens Area for 1979–2014 Time Period . . . . .</b>	529
M. Batakis, H.A. Flocas and A. Mavrakis	
<b>Statistical Analysis of a 124-Year Period of Precipitation Data in Thessaloniki . . . . .</b>	537
Nikoletta Pakalidou and Petroula Karacosta	
<b>Scaling Properties of Meteorological Time Series Using Detrended Fluctuation Analysis . . . . .</b>	545
N. Kalamaras, K. Philippopoulos and D. Deligiorgi	
<b>Comparison of ERA-Interim Reanalysis Data with Observed Surface Meteorological Data Over Greece . . . . .</b>	551
E. Stathi, T. Mavromatis, G. Koufos, G. Lazoglou, D. Stathis and S. Koundouras	
<b>Study of Precipitation Extremes in Cyprus. . . . .</b>	559
D. Katsanos, A. Retalis, F. Tymvios and S. Michaelides	
<b>Climatology of Upper Air Temperature Over the Mediterranean. Trends and Variability . . . . .</b>	565
C.M. Philandras, J. Kapsomenakis, P.T. Nastos, C. Repapis and C.S. Zerefos	
<b>Spatiotemporal Variability of Temperature and Rainfall in Western, Central and Northern Greece During the Last 45 Years in Correlation with Frontal Activity and Convection . . . . .</b>	577
A. Kanioura, V. Giannousis, K. Aggelou, D. Brikas and N. Vogiatzis	
<b>Homogenization of Precipitation Series in Greece. . . . .</b>	583
A. Mamara, A.A. Argiriou and M. Anadranistakis	
<b>Do RCMs Accurately Simulate the Etesians Climatology?. . . . .</b>	591
S. Dafka, A. Toreti, J. Luterbacher, P. Zanis, E. Tyrlis and E. Xoplaki	
<b>Geo-ethics: Past and Future Climate Variations and Changes. The Temperatures of the Past Are Continuously Changing. . . . .</b>	599
S. Pavlides	
<b>Positive Effects of Climate Change on the Field of Sopron Wine-Growing Region in Hungary . . . . .</b>	607
E. Kovacs, J. Puskas and A. Pozsgai	

**Simulated Dust Over the Sahara and Mediterranean with a Regional Climate Model (RegCM4)** . . . . . 615  
 A. Tsikerdekis, P. Zanis, A.L. Steiner, F. Solmon, V. Amiridis, E. Marinou, E. Katragkou and Theodore S. Karacostas

**A Study on the Intra-annual Variation and the Spatial Distribution of Lightning Activity Over Greece** . . . . . 621  
 C. Gatidis, C.J. Lolis, K. Lagouvardos, V. Kotroni and A. Bartzokas

**Seasonal Variability of Total Cloud Cover in the Mediterranean Region for the Period 1948–2014** . . . . . 629  
 E. Ioannidis, C.J. Lolis and A. Bartzokas

**Event-Based Climatology and Synoptic Conditions Associated with Fog at the “Macedonia” Airport** . . . . . 635  
 V. Dagkli and Theodore S. Karacostas

**Exploration of 12-km ERA-Interim Simulations from CORDEX Over the Levant** . . . . . 643  
 P. Hadjinicolaou, G. Zittis and J. Lelieveld

**Physics Parameterizations of Regional Climate Model RegCM4: Sensitivity to Convective Precipitation Schemes** . . . . . 649  
 K. Velikou, K. Tolika, C. Anagnostopoulou and P. Zanis

**Climate Change Assessments Over a Greek Catchment Using RCM’s Projection** . . . . . 655  
 C. Anagnostopoulou, K. Tolika, Ch. Skoulikaris and A. Zafirakou

**Impact of Climate Change in Greek Viticulture** . . . . . 663  
 G. Lazoglou and C. Anagnostopoulou

**Climate Projections on Estimating Water Balance in Havrias River Basin, Greece** . . . . . 669  
 P. Venetsanou, C. Anagnostopoulou and K. Voudouris

**Sensitivity Study of Cloud-Radiation Feedbacks in a Regional Climate Model Simulation Over Europe** . . . . . 677  
 M. Vavritsa, E. Katragkou, S. Kartsios, I. Pytharoulis and Theodore S. Karacostas

**Modes of Diurnal Variation of Illuminance in Bratislava, Slovakia, During Winter** . . . . . 683  
 A.V. Lytra, A. Bartzokas and S. Darula

**Climate Change Impact on the Establishment of the Invasive Mosquito Species (IMS)** . . . . . 689  
 E. Tagaris, R.E.P. Sotiropoulou, A. Sotiropoulos, I. Spanos, P. Milonas and A. Michaelakis

<b>Nearly Zero Energy Mediterranean Schools as a Mitigation Potential to Climate Change</b> . . . . .	695
N. Gaitani, L.C. Fabregas and M. Santamouris	
<b>Evaluation of Regional Climate Model Surface Solar Radiation Patterns Over Europe Using Satellite-Based Observations and Radiative Transfer Calculations.</b> . . . . .	701
G. Alexandri, A.K. Georgoulas, P. Zanis, E. Katragkou, A. Tsikerdekis, K. Kourtidis and C. Meleti	
<b>Evaluation of Summer Temperature and Precipitation of EURO-CORDEX Regional Climate Simulations.</b> . . . . .	707
V. Pavlidis, E. Katragkou, P. Zanis and Theodore S. Karacostas	
<b>Climatological Maps of Solar Energy in Greece from the Hellenic Network of Solar Energy</b> . . . . .	713
P. Tzoumanikas, E. Nikitidou, V. Salamalikis, Alkiviadis F. Bais and A. Kazantzidis	
<b>An NAO Climatology in Reanalysis Data with the Use of Self-organizing Maps</b> . . . . .	719
E. Rousi, U. Ulbrich, H.W. Rust and C. Anagnostopoulou	
<b>The ‘Storm Curtain’ Effect: Poleward Shift of Clouds, Their Radiative Effects, and the Role of Midlatitude Storms</b> . . . . .	725
G. Tselioudis and D. Konsta	
<b>Studying the Synoptic Wildfire Climatology in Greece. Implications to Wildfire Management</b> . . . . .	733
P. Kassomenos and A.K. Paschalidou	
<b>AUTH Regional Climate Model Contributions to EURO-CORDEX</b> . . .	741
E. Katragkou, I. Gkotovou, S. Kartsios, V. Pavlidis, K. Tsigaridis, M. Trail, L. Nazarenko and Theodore S. Karacostas	
<b>Complimentary Assessment of Forecast Performance with Climatologically Based Approaches</b> . . . . .	747
D. Boucouvala, F. Gofa and P. Fragkouli	
<b>Evidence of Dimming/Brightening Over Greece from Long-Term Observations of Sunshine Duration and Cloud Cover</b> . . . . .	753
D. Founda, F. Pierros and A. Sarantopoulos	
<b>Urban Heat Island in a Small Size Town in Northwestern Greece—A Comparison to Other Greek Areas.</b> . . . . .	759
V.N. Matthaïos, S.K. Garas and A.G. Triantafyllou	



**Part III Atmospheric Physics**

**Aerosol–Cloud Relations for Cloud Systems of Different Heights. . . . .** 769  
 S. Stathopoulos, K. Kourtidis and A.K. Georgoulas

**Aerosol Optical Properties Retrieval from Surface Radiation Measurements . . . . .** 775  
 G. Kosmopoulos and A. Kazantzidis

**From Hygroscopic Aerosols to Cloud Droplets: The HygrA-CD Campaign in the Athens Basin—An Overview . . . . .** 781  
 A. Papayannis, A. Argyrouli, A. Bougiatioti, A. Nenes, J. Vande Hey, M. Komppula, P. Kokkalis, S. Solomos, R.F. Banks, L. Labzovskii, I. Kalogiros and E. Giannakaki

**Long-Term Comparison of Lidar Derived Aerosol Optical Depth Between Two Operational Algorithms and Sun Photometer Measurements for Thessaloniki, Greece . . . . .** 789  
 K. Voudouri, N. Siomos, E. Giannakaki, V. Amiridis, G. D’Amico and D. Balis

**A 3-D Evaluation of the MACC Reanalysis Dust Product Over Europe Using CALIOP/CALIPSO Satellite Observations . . . . .** 795  
 A.K. Georgoulas, A. Tsikerdekis, V. Amiridis, E. Marinou, A. Benedetti, P. Zanis and K. Kourtidis

**Development of a Dust Assimilation System for NMM-DREAM Model Based on MSG-SEVIRI Satellite Observations . . . . .** 801  
 S. Solomos, S. Nickovic, V. Amiridis, G. Pejanovic, Y. Pradhan, F. Marengo, S. Petkovic, E. Marinou, B. Cvetkovic and C. Kontoes

**Synergistic Satellite and Modeling Methods for the Description of Biomass Smoke Dispersion Over Complex Terrain. The FireHub Platform . . . . .** 809  
 C. Kontoes, S. Solomos, V. Amiridis and T. Herekakis

**Vertical Separation of Desert Dust and Biomass Burning Aerosol Layers Over Thessaloniki Using the Synergy of Sunphotometer and Lidar Data. . . . .** 817  
 N. Siomos, M. Filioglou, A. Poupkou, N. Liora, S. Dimopoulos, D. Melas, A. Chaikovsky and D. Balis

**Near Real-Time Aerosol Predictions During the First Citizen Observatory Campaign in Greece . . . . .** 823  
 E. Athanopoulou, O. Speyer, S. Apostolopoulou, S. Papageorgiou, V. Amiridis and E. Gerasopoulos

<b>Aerosol Characterization by Means of Polly<sup>XT</sup> Raman Lidar at South Africa, India and Finland</b> . . . . .	831
E. Giannakaki, M. Filioglou and M. Komppula	
<b>Fine Particle Water and PH in an Urban and Remote Location and the Role of Biomass Burning</b> . . . . .	837
A. Bougiatioti, I. Stavroulas, L. Fourtziou, P. Nikolaou, D. Paraskevopoulou, G. Kouvarakis, A. Nenes and N. Mihalopoulos	
<b>The Contribution of Bioaerosols to the Organic Carbon Budget of the Atmosphere</b> . . . . .	845
S. Myriokefalitakis, G. Fanourgakis and M. Kanakidou	
<b>Aerosol Chemical Mass Closure in Athens, Greece: Towards a Better Understanding of the Seasonal Variation of Aerosol Sources in the Area</b> . . . . .	853
C. Theodosi, M. Tsagkaraki, P. Zarmas, P. Nikolaou, D. Paraskevopoulou, E. Liakakou, M. Lianou, E. Gerasopoulos and N. Mihalopoulos	
<b>Monitoring Particulate Pollution in the University of Patras Campus, Greece</b> . . . . .	861
A.A. Bloutsos and P.C. Yannopoulos	
<b>Short-Term Variability of Fine Inorganic Particulate Matter Over Athens, Greece</b> . . . . .	869
D. Paraskevopoulou, P. Zarmas, L. Fourtziou, E. Gerasopoulos and N. Mihalopoulos	
<b>Impact of Chemical Composition on NPF, CCN and Droplet Formation at South Aegean Sea During Summertime Etesians</b> . . . . .	875
P. Kalkavouras, E. Bossioli, G. Biskos, N. Mihalopoulos, A. Nenes and M. Tombrou	
<b>3D Saharan Dust Variability Over Europe as Seen by CALIPSO</b> . . . . .	883
E. Marinou, V. Amiridis, S. Solomos, E. Proestakis, M. Kottas, P. Zanis, A.K. Georgoulas, A. Tsikerdekis, A. Tsekeri, D. Konsta, P. Kokkalis, I. Biniotoglou and D. Balis	
<b>Aerosol Vertical Profiling Utilizing the Synergy of Lidar, Sunphotometry and In-Situ Measurements in the Framework of the ACTRIS-2 Campaign in Athens</b> . . . . .	891
A. Tsekeri, V. Amiridis, A. Lopatin, E. Marinou, M. Pikridas, J. Sciare, E. Gerasopoulos, E. Liakakou, H. Baars, M. Kottas, P. Kokkalis, I.P. Raptis, S. Solomos, I. Biniotoglou, N. Mihalopoulos, R. Engelmann, U. Wandinger, A. Ansmann, O. Dubovik and A. Nenes	

**Aerosol Radiative Effects Over Europe from the FORTH Radiation Transfer Model with AtmOptC Aerosol Optical Properties** . . . . . 899  
 M.B. Korras-Carraca, P.E. Charalampidis, C. Matsoukas, C. Pilinis, C. Fountoukis, S.N. Pandis, N. Hatzianastassiou and I. Vardavas

**Sources of Atmospheric Aerosols in Heraklion, Crete During Winter Time** . . . . . 905  
 N. Kalivitis, G. Kouvarakis, I. Stavroulas, E. Tzitzikalaki, M. Kandilogiannaki, K. Vavadaki and N. Mihalopoulos

**The Effect of Four Major Volcanic Eruptions on Atmospheric Aerosol Loading Based on Satellite Data** . . . . . 911  
 C. Tsarsitalidou, N. Hatzianastassiou and I. Vardavas

**A Satellite Based Algorithm for Identification of Biomass Burning Aerosols Over the Southern Atlantic Ocean** . . . . . 919  
 N. Kalaitzi, N. Hatzianastassiou, A. Gkikas and C.D. Papadimas

**Evaluating Dust Contribution to CCN Using Satellite Observations** . . . . . 925  
 M. Sfakianaki, S. Myriokefalitakis and M. Kanakidou

**Simulations of New Particle Formation and Growth Processes at Eastern Mediterranean, with the MALTE-Box Model** . . . . . 933  
 E. Tzitzikalaki, N. Kalivitis, G. Kouvarakis, N. Daskalakis, V.-M Kerminen, N. Mihalopoulos, N. Boy and M. Kanakidou

**Modulation of Atmospheric Dynamics and Dust Emissions in Southwest Asia by the Caspian Sea—Hindu Kush Index** . . . . . 941  
 D.G. Kaskaoutis, E.E. Houssos, A. Rashki, A. Bartzokas, M. Legrand, P. Francois and H.D. Kambezidis

**Seasonal Variations of the Mineralogical Composition and the Organic Matter Content of Falling Dust in Thessaloniki During 2012-13** . . . . . 949  
 P. Kollias, N. Kantiranis, I. Pytharoulis and P. Zanis

**Weekend—Weekday Effect Assessment of PM<sub>10</sub> in Volos, Greece (2010–2014)** . . . . . 957  
 G. Proias, P.T. Nastos, K.P. Moustris and Athanasios G. Paliatsos

**An Analysis of Identification of Stratospheric Intrusions and Their Influence on Ozone Distribution Over Eastern Mediterranean Using MACC Reanalysis** . . . . . 963  
 G. Michailoudi and P. Zanis

**An Assessment of Near Surface Ozone Over Europe from the Global CAMS Interim Reanalysis** . . . . . 969  
 P. Zanis, D. Akritidis, A. Tsikerdekis, J. Kapsomenakis, S. Kontos, D. Melas, C.S. Zerefos, J. Flemming and E. Katragkou

<b>Tropopause Folds Over the Eastern Mediterranean and the Middle East in EMAC Simulations: Implications for Summertime Tropospheric Ozone</b> . . . . .	975
D. Akritidis, A. Pozzer, P. Zanis, E. Tyrlis, B. Škerlak, M. Sprenger and J. Lelieveld	
<b>Multi-decadal Trend Analysis of Total Columnar Ozone Over Thessaloniki</b> . . . . .	983
K. Fragkos, M. Taylor, Alkiviadis F. Bais, I. Fountoulakis, K. Tourpali, C. Meleti and M.M. Zempila	
<b>Total Ozone Data Retrieval from the Phaethon DOAS System</b> . . . . .	989
F. Gkertsis, Alkiviadis F. Bais, Th. Drosoglou, K. Fragkos, I. Fountoulakis and N. Kouremeti	
<b>A Review of Surface and Lower Troposphere Ozone Concentration Characteristics Around the Urban Area of Athens, the Aegean Sea and at the Central and Eastern Mediterranean</b> . . . . .	995
P. Kalabokas and C. Repapis	
<b>Mapping the Air Quality in the City of Patras by Combining Mobile Platform Measurements and CFD Simulations</b> . . . . .	1001
A.G. Kalampounias, C. Stamatis, C. Kaltsonoudis, N. Bali, A. Kalarakis and S.N. Pandis	
<b>A New Approach for the Construction of Emission Inventories from Satellite Data</b> . . . . .	1007
K. Kourtidis and A.K. Georgoulas	
<b>Top-Down SO<sub>2</sub> Emissions Over China; A Satellite Approach</b> . . . . .	1015
M.E. Koukouli, N. Theys, J. Ding, I. Zyrichidou, D. Balis and R. van der A	
<b>The Impact of Fine Particulate Outdoor Air Pollution to Premature Mortality</b> . . . . .	1021
D. Giannadaki, J. Lelieveld and A. Pozzer	
<b>Investigating the Impact of the Economic Recession Over Mediterranean Urban Regions on Satellite-Based Formaldehyde Columns; Comparison with Chemistry Transport Model Results</b> . . . . .	1027
I. Zyrichidou, D. Balis, N. Liora, A. Poupkou, C. Giannaros, D. Melas, M.E. Koukouli, I. De Smedt, M. van Roozendael and R. van der A	
<b>A Robust Seasonality Detector for Geophysical Time Series: Application to Satellite SO<sub>2</sub> Observations Over China</b> . . . . .	1035
M. Taylor, M.E. Koukouli, N. Theys, J. Bai, M.M. Zempila, D. Balis, M. van Roozendael and R. van der A	

<b>Impact of Shipping Emissions on European Air Quality . . . . .</b>	1043
R.E.P. Sotiropoulou and E. Tagaris	
<b>Evaluating the Performance of the RegCM-Chem4 Model in the Simulation of Ozone Levels During Heat Waves in China . . . . .</b>	1051
A. Poupkou, X. Huang, D.K. Papanastasiou, X. Pu, P. Zanis, T. Wang, A. Garane and D. Melas	
<b>Evaluation of Ozone Levels from MACC Global and Regional Modelling Systems Over Eastern Mediterranean—The Influence of Etesian Winds . . . . .</b>	1059
E. Solomou, S. Bolis, A. Poupkou, P. Zanis, M. Lazaridis and D. Melas	
<b>Evaluation of the Measurements of the Multi-Gas Long Path Air Quality Monitoring System SANOA . . . . .</b>	1067
K. Rizos, C. Meleti, D. Melas and P. Zanis	
<b>Comparison of Ground-Based Tropospheric NO<sub>2</sub> Columns with OMI/Aura Products in the Greater Area of Thessaloniki by Means of an Air Quality Modeling Tool . . . . .</b>	1075
Th. Drosoglou, Alkiviadis F. Bais, I. Zyrichidou, A. Poupkou, N. Liora, C. Giannaros, M.E. Koukouli, N. Kouremeti, S. Dimopoulos, D. Balis and D. Melas	
<b>Generating a “Typical Air Pollutant Day” in Thriasio Plain, Greece . . . . .</b>	1081
M. Toumpos, H.A. Flocas, A. Christides and A. Mavrakis	
<b>An Air Quality Management System for Cyprus: Evaluation and Improvements. . . . .</b>	1087
N. Moussiopoulos, E. Chourdakis and G. Tsegas	
<b>Air Pollution Modeling in a North Aegean City: Effects of the Transportation System on Local Air Quality . . . . .</b>	1093
A.M. Kotrikla, M.B. Korras-Carraca, K. Dimou, E. Triantafyllou, K.M. Fameli, C. Psanis, A.A. Floutsi and G. Biskos	
<b>Two Years of Air Pollution Measurements at Athens Center: Variability and Role of Wood Burning . . . . .</b>	1099
E. Liakakou, E. Gerasopoulos, M. Lianou, L. Fourtziou, B. Psiloglou, J. Sciare and N. Mihalopoulos	
<b>Estimation of Hospital Admissions Respiratory Disease Attributed to PM<sub>10</sub> Exposure Using the AirQ Model Within the Greater Athens Area. . . . .</b>	1105
K. Ntourou, K.P. Moustris, M. Giannouli, P.T. Nastos and Athanasios G. Paliatsos	

<b>An Overview of Biomass Burning Impacts on Athens Air Quality and Analysis of Its Increasing Significance</b> . . . . .	1111
E. Gerasopoulos, M. Gratsea, E. Liakakou, M. Lianou, B. Psiloglou, N. Kappos, H. Kambezidis and N. Mihalopoulos	
<b>Impacts of Coarse Atmospheric Particulate Matter Between 2.5 and 80 <math>\mu\text{m}</math> on Respiratory Admissions in Heraklion, Crete Island, Greece</b> . . . . .	1117
A. Bleta, P.T. Nastos, U. Kaminski and V. Dietze	
<b>An Up-to-Date Assessment of the Air Quality in Greece with the Use of Modeling Tools</b> . . . . .	1123
D. Melas, N. Liora, A. Poupkou, C. Giannaros, S. Dimopoulos, S. Kontos, P. Symeonidis, A. Progiou, A. Sitara, D. Economides and I. Ziomas	
<b>Air-Quality Impact of Cruise and Passenger Ship Emissions in the Port of Thessaloniki</b> . . . . .	1129
S. Kontos, N. Liora, A. Poupkou, C. Giannaros, A. Garane and D. Melas	
<b>An Integrated Numerical Methodology for the Study of Transport of Air Pollution in the Coupled Indoor and Outdoor Environment</b> . . . .	1135
G. Tsegas, F. Barmpas and N. Moussiopoulos	
<b>Benzene and Toluene Levels in the Atmosphere of Athens During Wintertime: Influence of Financial Crisis on Traffic and Biomass Burning Emissions</b> . . . . .	1141
B. Psiloglou, N. Mihalopoulos and Athanasios G. Paliatsos	
<b>Estimation of the Solar Energy Potential in Greece Using Satellite and Ground-Based Observations</b> . . . . .	1149
P.G. Kosmopoulos, S. Kazadzis, M. Taylor, Alkiviadis F. Bais, K. Lagouvardos, V. Kotroni, I. Keramitsoglou and C. Kiranoudis	
<b>The Effect of Clouds on Surface Solar Irradiance, from an All-Sky Camera, in Thessaloniki, Greece</b> . . . . .	1157
E. Nikitidou, P. Tzoumanikas, Alkiviadis F. Bais and A. Kazantzidis	
<b>The Atmospheric Water Vapor Effect on Direct Normal Irradiance Under Clear Skies</b> . . . . .	1163
E. Kampouris, V. Salamalikis and A. Kazantzidis	
<b>On the Enhancement of Solar Irradiance Due to the Presence of Clouds at Patras, Greece</b> . . . . .	1169
I. Vamvakas and A. Kazantzidis	
<b>All-Sky Imager: A New Instrument for the Estimation of Solar Irradiance, Cloudiness and Aerosol Optical Properties</b> . . . . .	1175
A. Kazantzidis, P. Tzoumanikas, E. Nikitidou and V. Salamalikis	