IAMAS REPORT

International Association of Meteorology and Atmospheric Sciences (IAMAS)

ACTIVITIES IN GREECE

FOR THE PERIOD 2015-2018

Edited by

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Contributions by:

- *Research Centre for Atmospheric Physics and Climatology, Academy of Athens*
- *Environmental Chemical Processes Laboratory (ECPL), University of Crete*
- *Laboratory of Atmospheric Physics, Department of Physics, Aristotle University of Thessaloniki*
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- *Laboratory of Atmospheric Physics – Department of Physics – University of Patras*
- *Dept. of Environmental Engineering, Demokritus University of Thrace*
- *Laboratory of Meteorology, Department of Physics, University of Ioannina*
- *Laboratory of Laser Remote Sensing of the Atmosphere, Dept. of Physics, National Technical University of Athens*
- *Hellenic national Meteorological Service / HNMS*

April 2019

Contents

FOREWORD

This report was prepared as part of the national report of the Committee of Geodesy and Geophysics of Greece, on the occasion of the 28th General Assembly of the International Union of Geodesy and Geophysics (IUGG) which will be held in Montreal, Canada, July 8 – July 18, 2019.

The content of the report is divided in eleven sections with each section being entitled with the name of the corresponding university institute or agency. The contribution of each institute is reported based on the material they provided along with the respective list of literature. An attempt was made to slightly homogenize the material provided by the respective contributors. Therefore, the text and, in general, the style of each sub-report, have been maintained in the subsequent sections.

I take the opportunity to express my sincere thanks to all colleagues working at University Departments, Research Institutions and National Agencies for their contributions, extensive lists of publications and other relevant material provided for the compilation of this report.

Athens, April 2019

Prof. Christos S. Zerefos
Academy of Athens

Research Centre for Atmospheric Physics and Climatology, Academy of Athens

Participation in national networks

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation – EPAnEK 2014-2020), Coordinator N. Mihalopoulos, University of Crete, 2018-2021 (http://panacea-ri.gr/).

Participation in International networks

«A European Brewer Network (EUBREWNET)», Cost Action ES1207, Coordinator J. Rimmer, University of Manchester, UK, 2013–2017 (http://www.eubrewnet.org/cost1207/).

Field measurements

Ozone and ultraviolet radiation measurements at the Biomedical Research Foundation of the Academy of Athens (continuously operational since 06.2003), listed at http://www.uvnet.gr/ and http://www.bioacademy.gr/lab/zerefos.

Indicative funding

«Copernicus Atmosphere Monitoring Service CAMS-84: Global and regional a posteriori validation, including focus on the Arctic and Mediterranean areas-CAMS-84», Horizon 2020 Project, Coordinator Henk Eskes, 2015.

«SMart URBan Solutions for air quality, disasters and city growth (SMURBS)», Horizon 2020 Project, Coordinator Nicola Pirrone, 2015.

«Coordinating and integrating Regional, state-of-the-art Earth Observation Activities in NA, ME, and Balkans and Developing Links with GEO related initiatives towards GEOSS – GEO CRADLE», Horizon 2020 Project, Coordinator Harris Kontoes, National Observatory of Athens, 2015.

«Copernicus Application Facility for Environmental Effects on Health and Comfort-CLAIRE» Horizon 2020 Project, Coordinator Ifigenia Keramitsoglou, National Observatory of Athens, 2017.

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation – EPAnEK 2014-2020), Coordinator N. Mihalopoulos, University of Crete, 2018-2021, 55.000€.

«Boosting the implementation of adaptation policy across Greece: LIFE-IP AdaptInGR», LIFE project, 2018-2025.

Indicative publications

1. Raptis, P.I., S. Kazadzis, K. Eleftheratos, P. Kosmopoulos, V. Amiridis, C. Helmis, C. Zerefos, "Total Ozone Column Measurements using an Ultraviolet Multifilter Radiometer", Inter. J. of Rem. Sens., 36:17, 4469-4482, DOI: 10.1080/01431161.2015.1083631, 2015
2. Kalabokidis, K., P. Palaiologou, E. Gerasopoulos, C. Giannakopoulos, E. Kostopoulou and C. Zerefos, "Effect of climate change projections on forest fire behavior and values-at-risk in southwestern Greece", Forests, 6(6): 2214-2240, 2015
3. Founda, D., F. Pierros, M. Petrakis, C. Zerefos, "Interdecadal variations and trends of the Urban Heat Island in Athens (Greece) and its response to heat waves", Atmos. Res., 161-162, 2015
4. Katragkou, E., P. Zanis, A. Tsikerdekis, J. Kapsomenakis, D. Melas, H. Heskes, J. Flemming, V. Huijnen, A. Inness, M.G. Schultz, O. Stein, C.S. Zerefos "Evaluation of near surface ozone over Europe from the MACC reanalysis", Geosci. Model Dev., 8, 2299-2314, 2015
5. Eskes, H., V. Huijnen, A. Arola, A. Benedictow, A.-M. Blechschmidt, E. Botek, O. Boucher, I. Bouarar, S. Chabrillat, E. Cuevas, R. Engelen, H. Flentje, A. Gaudel, J. Griesfeller, L. Jones, J. Kapsomenakis, E. Katragkou, S. Kinne, B. Langerock, M. Razinger, A. Richter, M. Schultz, M. Schulz, N. Sudarchikova, V. Thouret, M. Vrekoussis, A. Wagner, and C. Zerefos, "Validation of reactive gases and aerosols in MACC global analysis and forecast system", Geosci. Model Dev., 8, 3523-3543, 2015
6. Inness A., A.-M. Blechschmidt, I. Bouarar, S. Chabrillat, M. Crepulja, R. J. Engelen, H. Eskes, J. Flemming, A. Gaudel, F. Hendrick, V. Huijnen, L. Jones, J. Kapsomenakis, E. Katragkou, A. Keppens, B. Langerock, M. de Mazière, D. Melas, M. Parrington, V. H. Peuch, M. Razinger, A. Richter, M. G. Schultz, M. Suttie, V. Thouret, M. Vrekoussis, A. Wagner, and C. Zerefos, "Data assimilation of satellite-retrieved ozone, carbon monoxide and nitrogen dioxide with ECMWF's Composition-IFS", Atmos. Chem. Phys., 15, 5275–5303, 2015
7. Dafka, S., E. Xoplaki, A. Toreti, P. Zanis, E. Tyrlis, C. Zerefos, J. Luterbacher "The Etesians: from observations to reanalysis", Climate Dynamics, DOI: 10.1007/s00382-01502920-7, 2015
8. Voloudakis, D., A. Karamanos, , G. Economou, D. Kalivas, P. Vahamidis, V. Kotoulas, J. Kapsomenakis C. Zerefos, "Prediction of climate change impacts on

cotton yields in Greece under eight climatic models using the AquaCrop crop simulation model and discriminant function analysis". Agricultural Water Management, 147, 116-128, 2015

9. Wagner, A., A.M. Blechschmidt, I. Bouarar, E.G. Brunke, C. Lerbaux, M. Cupeiro, P. Cristofanelli, H. Eskes, J. Flemming, H. Flentje, M. George, S. Gilge, A. Hilboll, A. Inness, J. Kapsomenakis, A. Richter, L. Ries, W. Spangl, O. Stein, R. Weller, C. Zerefos "Evaluation of the MACC operational forecast system potential and challenges of global near-real-time modelling with respect to reactive gases in the troposphere", ACP, 14005-14030, http://www.atmos-chem-phys.net/15/14005/2015/, doi: 10.5194/acp-15-14005-2015.

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11. Hassinen, S., D. Balis, H. Bauer, M. Begoin, A. Delcloo, K. Eleftheratos, S. Gimeno Garcia, J. Granville, M. Grossi, N. Hao, P. Hedelt, F. Hendrick, M. Hess, K.-P. Heue, J. Hovila, H. Helge Jønch-Sørensen, N. Kalakoski, M. Koukouli, J. Kujanpää, J.-C. Lambert, C. Lerot, D. Loyola, A. Määttä, G. Pinardi, F. Romahn, M. van Roozendael, R. Lutz, I. De Smedt, P. Stammes, W. Steinbrecht, J. Tamminen, N. Theys, L. G. Tilstra, O. N. E. Tuinder, P. Valks, C. Zerefos, W. Zimmer, and E. Zyrichidou "Overview of the O3M SAF GOME-2 operational atmospheric composition and UV radiation data products and data availability", Atmos. Meas. Techn., 9, 383-407, 2016

12. Zerefos, C. S., K. Eleftheratos, J. Kapsomenakis, S. Solomos, A. Inness, D. Balis, A. Redondas, H. Eskes, V. Amiridis, C. Repapis, M. Allaart, R. Engelmann, A. Dahlback, V. De Bock, H. Diémoz, P. Eriksen, J. Gröbner, A. Heikkilä, J. Jarosławski, W. Josefsson, T. Karppinen, U. Köhler, C. Meleti, C. Repapis, J. Rimmer, V. Savinykh, V. Shirotov, A. M. Siani, A. R. D. Smedley, M. Stanek, and R. Stübi, "Detecting volcanic sulfur dioxide plumes in the Northern Hemisphere using the Brewer spectrophotometer, other networks, and satellite observations", Atmospheric Chemistry and Physics Discussions, doi:10.5194/acp-2016-500, 2016.

13. Luterbacher, J., J P Werner, J E Smerdon, L Fernández-Donado, F J González-Rouco, D. Barriopedro, FC Ljungqvist, U. Büntgen, E. Zorita, S. Wagner, J. Esper, D. McCarroll, A. Toreti, D. Frank, J.H. Jungclaus, M. Barriendos, C. Bertolin, O. Bothe, R. Brázdil, D. Camuffo, P. Dobrovolný, M. Gagen, E. García-Bustamante, Q. Ge, J.J. Gómez-Navarro, J. Guiot, Z. Ha, G.C. Hegerl, K. Holmgren,V.V. Klimenko, J. Martín-Chivelet, C. Pfister, N. Roberts, A. Schindler, A. Schurer, O. Solomina, L. von Gunten, E. Wahl, H. Wanner, O. Wetter, E. Xoplaki, N. Yuan, D. Zan-

chettin, H. Zhang, C. Zerefos, “European summer temperatures since Roman times”, Environ. Res. Lett. 11, doi:10.1088/1748-9326/11/2/024001, 2016

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15. Hassinen, S., D. Balis, H. Bauer, M. Begoin, A. Delcloo, K. Eleftheratos, S. Gimeno Garcia, J. Granville, M. Grossi, N. Hao, P. Hedelt, F. Hendrick, M. Hess, K.-P. Heue, J. Hovila, H. Helge Jønch-Sørensen, N. Kalakoski, M. Koukouli, J. Kujanpää, J.-C. Lambert, C. Lerot, D. Loyola, A. Määttä, G. Pinardi, F. Romahn, M. van Roozendael, R. Lutz, I. De Smedt, P. Stammes, W. Steinbrecht, J. Tamminen, N. Theys, L. G. Tilstra, O. N. E. Tuinder, P. Valks, C. Zerefos, W. Zimmer, and E. Zyrichidou “Overview of the O3M SAF GOME-2 operational atmospheric composition and UV radiation data products and data availability”, Atmos. Meas. Techn., 9, 383-407, 2016.

16. Zerefos, C. S., K. Eleftheratos, J. Kapsomenakis, S. Solomos, A. Inness, D. Balis, A. Redondas, H. Eskes, M. Allaart, V. Amiridis, A. Dahlback, V. De Bock, H. Diémoz, R. Engelmann, P. Eriksen, V. Fioletov, J. Gröbner, A. Heikkilä, I. Petropavlovskikh, J. Jarosławski, W. Josefsson, T. Karppinen, U. Köhler, C. Meleti, C. Repapis, J. Rimmer, V. Savinykh, V. Shirotov, A. M. Siani, A. R. D. Smedley, M. Stanek, and R. Stübi, Detecting volcanic sulfur dioxide plumes in the Northern Hemisphere using the Brewer spectrophotometer, other networks, and satellite observations, Atmos. Chem. Phys., 17, 551–574, doi: 10.5194/acp-17-551-2017, 2017.

17. Zerefos, C., J. Kapsomenakis, K. Eleftheratos, K. Tourpali, I. Petropavlovskikh, D. Hubert, S. Godin-Beekmann, W. Steinbrecht, S. Frith, V. Sofieva, B. Hassler, “Representativeness of single lidar stations for zonally averaged ozone profiles, their trends and attribution to proxies”, Atmos. Chem. Phys., 18(9), 6427-6440, 2018.

18. Voloudakis, D., A. Karamanos, G. Economou, J. Kapsomenakis, C. Zerefos “A comparative estimate of climate change impacts on cotton and maize in Greece”, Journal of Water and Climate Change, 9(4), 643-656, https://doi.org/10.2166/wcc.2018.022,2018.

19. Fountoulakis, I., C.S. Zerefos, A.F. Bais, J. Kapsomenakis, M.E. Koukouli, N. Ohkawara, V. Fioletov, H. De Backer, K. Lakkala, T. Karppinen, A.R. Webb, “25 years of spectral UV-B measurements over Canada, Europe and Japan: trends and effects from changes in ozone, aerosols, clouds and surface reflectivity”, Comptes Rendus Geoscience, 350(7), 393-402, https://doi.org/10.1016/j.crte.2018.07.011, 2018.

20. Eleftheratos, K., C. Zerefos, D. Balis, M.E. Koukouli, J. Kapsomenakis, D. Loyola, P. Valks, M. Coldewey-Egbers, C. Lerot, S. Frith, A. Søvde-Haslerud, I. Isaksen, S. Hassinen, “The use of QBO, ENSO and NAO perturbations in the evaluation of GOME-2/MetopA total ozone measurements”, Atmos. Meas. Tech., 12, 987-1011, https://doi.org/10.5194/amt-12-987-2019, 2019.

Institute for Environmental Research & Sustainable Development, National Observatory of Athens (IERSD-NOA)

Participation in national networks

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021 (http://panacea-ri.gr/).

Participation in International networks

«Aerosols, Clouds, and Trace gases Research InfraStructure (ACTRIS-2)», European Commission Horizon 2020 Research and Innovation Framework Programme, (H2020-INFRAIA2-2014-2015) grant agreement no. 654109 (https://www.actris.eu/).

«SMartURBan Solutions for air quality, disasters and city growth (SMURBS/ERA-PLANET), ERA-NET-Cofund under (H2020-SC5-15-2015 – Strengthening the European Research Area in the domain of Earth Observation, grant agreement no. 689443 (smurbs.eu/).

Field measurements

Thissio Atmospheric Pollution Monitoring station has been operating since December 2013 at the premises of the National Observatory of Athens historical site located downtown Athens, characteristic for urban background conditions, measuring on-line aerosol mass, chemical composition of main non-refractory components, number size distribution, absorption and scattering.

Furthermore, the Atmospheric Chemistry Laboratory of the National Observatory of Athens disposes of a mobile unit monitoring station in a specified VAN vehicle for the monitoring of the main atmospheric pollutants (PM_{10}, CO, NO, NO_2, SO_2, BC).

Indicative funding

« Aerosols, Clouds, and Trace gases Research InfraStructure (ACTRIS-2)», European Commission Horizon 2020 Research and Innovation Framework Programme, 05.2015-05.2019, 550.000€.

« Aerosols, Clouds, and Trace gases Research InfraStructure, Project Preparation Phase (ACTRIS-PPP)», European Commission Horizon 2020 Research and Innovation Framework Programme, 05.2015-05.2019, 160.000€.

SMartURBan Solutions for air quality, disasters and city growth (SMURBS/ERA-PLANET), ERA-NET-Cofund under (H2020-SC5-15-2015 – Strengthening the European

Research Area in the domain of Earth Observation, 09.2017-08.2020, 1.200,000€ (33% EU funding).

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 11.2018-10.2021, 580.000€.

Indicative publications

1. Theodosi, C., Grivas, G., Zarmpas, P., Chaloulakou, A., and Mihalopoulos, N.: Mass and chemical composition of size-segregated aerosols (PM1, PM2.5, PM10) over Athens, Greece: local versus regional sources, Atmos. Chem. Phys., 11, 11895-11911, https://doi.org/10.5194/acp-11-11895-2011, 2011.

2. Paraskevopoulou, D., Liakakou, E., Gerasopoulos, E., Theodosi, C., and Mihalopoulos, N.: Long-term characterization of organic and elemental carbon in the PM2.5 fraction: the case of Athens, Greece, Atmos. Chem. Phys., 14, 13313-13325, https://doi.org/10.5194/acp-14-13313-2014, 2014.

3. D. Paraskevopoulou, Liakakou, E., Gerasopoulos, E., Mihalopoulos, N.: Sources of atmospheric aerosol from long-term measurements (5 years) of chemical composition in Athens, Greece, Science of The Total Environment, Vol. 527–528, Pages 165-178, ISSN 0048-9697, http://dx.doi.org/10.1016/j.scitotenv.2015.04.022, 2015.

4. E. Athanasopoulou, A. Protonotariou, G. Papangelis, M. Tombrou, N. Mihalopoulos, E. Gerasopoulos, Long-range transport of Saharan dust and chemical transformations over the Eastern Mediterranean, Atmospheric Environment, Volume 140, Pages 592-604, https://doi.org/10.1016/j.atmosenv.2016.06.041, 2016.

5. Myrto Gratsea, Mihalis Vrekoussis, Andreas Richter, Folkard Wittrock, Anja Schönhardt, John Burrows, Stelios Kazadzis, Nikos Mihalopoulos, Evangelos Gerasopoulos, Slant column MAX-DOAS measurements of nitrogen dioxide, formaldehyde, glyoxal and oxygen dimer in the urban environment of Athens, Atmospheric Environment, Volume 135, Pages 118-131, https://doi.org/10.1016/j.atmosenv.2016.03.048, 2016.

6. L. Fourtziou, E. Liakakou, I. Stavroulas, C. Theodosi, P. Zarmpas, B. Psiloglou, J. Sciare, T. Maggos, K. Bairachtari, A. Bougiatioti, E. Gerasopoulos, R. Sarda-Estève, N. Bonnaire, and N. Mihalopoulos: "Multi-tracer approach to characterize domestic wood burning in Athens (Greece) during wintertime", Atmospheric Environment, 148, 89-101, 2017.

7. Athanasopoulou, E., Speyer, O., Brunner, D., Vogel, H., Vogel, B., Mihalopoulos, N., and Gerasopoulos, E.: Changes in domestic heating fuel use

in Greece: effects on atmospheric chemistry and radiation, Atmos. Chem. Phys., 17, 10597-10618, https://doi.org/10.5194/acp-17-10597-2017 , 2017.

8. Theodosi, C., Tsagkaraki, M., Zarmpas, P., Grivas, G., Liakakou, E., Paraskevopoulou, D., Lianou, M., Gerasopoulos, E., and Mihalopoulos, N.: Multi-year chemical composition of the fine-aerosol fraction in Athens, Greece, with emphasis on the contribution of residential heating in wintertime, Atmos. Chem. Phys., 18, 14371-14391, https://doi.org/10.5194/acp-18-14371-2018 , 2018.

9. Kalkavouras, P., Bougiatioti, A., Kalivitis, N., Tombrou, M., Nenes, A., and Mihalopoulos, N.: Regional New Particle Formation as Modulators of Cloud Condensation Nuclei and Cloud Droplet Number in the Eastern Mediterranean, Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-1254 , in review, 2018.

10. Katsanos, D., Bougiatioti, A., Liakakou, E., Kaskaoutis, D.G., Stavroulas, I., Paraskevopoulou, D., Lianou, M., Psioglou, B.E., Gerasopoulos, E., Pilinis, C., and Mihalopoulos, N.: Optical properties of near-surface urban aerosols and their chemical tracing in a Mediterranean city (Athens), Aerosol Air Qual. Res., in Press, doi:10.4209/aaqr.2017.11.0544, 2019.

11. Stavroulas, I., Bougiatioti, A., Grivas, G., Paraskevopoulou, D., Tsagkaraki, M., Zarmpas, P., Liakakou, E., Gerasopoulos, E., and Mihalopoulos, N.: Sources and processes that control the submicron organic aerosol composition in an urban Mediterranean environment (Athens): a high temporal-resolution chemical composition measurement study, Atmos. Chem. Phys., 19, 901-919, https://doi.org/10.5194/acp-19-901-2019 , 2019.

12. Paraskevopoulou, D., Bougiatioti, A., Stavroulas, I., Fang, T., Lianou, M., Liakakou, E., Gerasopoulos, E., Weber, R., Nenes, A., and Mihalopoulos, N.: Yearlong variability of oxidative potential of particulate matter in an urban Mediterranean environment, Manuscript accepted for publication in Atmospheric Environment.

Environmental Chemical Processes Laboratory (ECPL), University of Crete

Participation in national networks

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021 (http://panacea-ri.gr/).

Participation in International networks

«Aerosols, Clouds, and Trace gases Research InfraStructure (ACTRIS-2)», European Commission Horizon 2020 Research and Innovation Framework Programme, (H2020-INFRAIA2-2014-2015) grant agreement no. 654109 (https://www.actris.eu/).

Field measurements

Finokalia station: It is a regional background station operating since 1993 and measuring the main gaseous components of the atmosphere (O3, NOx, CO), on-line aerosol mass, chemical composition of main non-refractory components, number size distribution, absorption, scattering as well as chemical composition of the wet and dry deposition. Finokalia disposes the longest time series for several pollutants in the Esatern Mediterranean. Since 2015 greenhouse gases are also measured for the first time in Greece.

Indicative funding

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 11.2018-10.2021, 780.000€.

Indicative publications

1. Papadimas, C.D., Hatzianastassiou, N., Matsoukas, C., Kanakidou, M., Mihalopoulos, N., Vardavas, I., The direct effect of aerosols on solar radiation over the broader Mediterranean basin, Atmospheric Chemistry and Physics, 2012, 12, 7165. http://www.atmos-chem-phys.net/12/7165/2012/
2. Christodoulaki, S., Petihakis, G., Kanakidou, M., Mihalopoulos, N., Tsiaras, K., Triantafyllou, G., Atmospheric deposition in the eastern Mediterranean. A

driving force for ecosystem dynamics, Journal of Marine Systems, doi: 10.1016/j.jmarsys.2012.07.007.

3. Zanis, P. , Hadjinicolaou, P., Pozzer, A., Tyrlis, E., Dafka, S., Mihalopoulos, N., Lelieveld, J, 2014, Summertime free-tropospheric ozone pool over the eastern Mediterranean/middle east , Atmos. Chem and Phys., 14, 115-132, 2014.
4. Myriokefalitakis, S., Daskalakis, N., Mihalopoulos, N., Baker, A.R., Nenes, A., Kanakidou, M., Changes in dissolved iron deposition to the oceans driven by human activity: a 3-D global modelling study, Biogeosciences, Volume 12, Issue 13, Pages 3973-3992, 2015.
5. Christodoulaki, S., Petihakis, G., Mihalopoulos, N., Tsiaras, K., Triantafyllou, G., Kanakidou, M., Human-driven atmospheric deposition of N and P controls on the east Mediterranean marine ecosystem, Journal of the Atmospheric Sciences, Volume 73, Issue 4, 1 April 2016, Pages 1611-1619.
6. Myriokefalitakis, S., Nenes, A., Baker, A.R., Mihalopoulos, N., Kanakidou, M., Bioavailable atmospheric phosphorous supply to the global ocean: A 3-D global modeling study, Biogeosciences, Volume 13, Issue 24, 15 December 2016, Pages 6519-6543.
7. M Kanakidou, S Myriokefalitakis, K Tsigaridis, Aerosols in atmospheric chemistry and biogeochemical cycles of nutrients, Environmental Research Letters 13 (6), 063004D, 2018.
8. Theodosi C., Panagiotopoulos C., Nouara A., Zarmpas P., Nicolaou P., Violaki K., Kanakidou M., Sempéré R., Mihalopoulos N., Sugars in atmospheric aerosols over the Eastern Mediterranean, Progress in Oceanography, Article in Press.
9. K Tsigaridis, M Kanakidou, The present and future of secondary organic aerosol direct forcing on climate, Current Climate Change Reports, 1-15, 2018

Laboratory of Atmospheric Physics, Department of Physics, Aristotle University of Thessaloniki

Participation in national networks

- Panhellenic infrastructure for atmospheric composition and climate change (PANACEA), Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021.

http://panacea-ri.gr/

Participation in International networks

- European Aerosol Research Lidar Network, European Research Infrastructure for the observation of Aerosol, Clouds and Trace Gases, EARLINET-ACTRIS2, EU FP7, 05.2015-05.2019.

https://www.earlinet.org/index.php?id=earlinet_homepage

- A European Brewer Network (EUBREWNET) Cost Action ES 1207

http://www.eubrewnet.org/cost1207/

- SOLARIS-HEPPA – Solar Influences on Climate, SPARC-WRCP Activity,

https://www.sparc-climate.org/activities/solar-influence/

- Variability of the Sun and Its Terrestrial Impact, (VarSITI)/ROSMIC (Role Of the Sun and the Middle atmosphere/thermosphere/ionosphere In Climate) 2014-2018, http://www.varsiti.org/

- Towards a more complete assessment of the impact of solar variability on the Earth's climate, EU -Cost Action1005 (TOSCA), 2011-2015, www.cost-tosca.eu

- Air Quality Modelling Evaluation International Initiative (AQMEII), http://aqmeii.jrc.ec.europa.eu/

- Forum for air quality modelling in Europe , http://fairmode.jrc.ec.europa.eu/

Field measurements

- XII RBCCE Intercomparison Campaign “El Arenosillo” Atmospheric Sounding Station, INTA, May 29 – Jun 7 2017

- ATMOZ project Field Validation campaign, Izaña Observatory, Tenerife, 12 - 28 Sep 2016

- Second Cabauw Intercomparison of Nitrogen Dioxide measuring Instruments, Cabauw, The Netherlands, 25 August – 7 October 2016

Current National and International Funded Research Projects

Project title	Funding agency	Start date	End date	Budget
Innovative system for air quality monitoring and forecasting	ΕΣΠΑ 2014-2020	25/07/2018	24/07/2021	382.639,00
Optical and geometrical properties of clouds and aerosols using ground-based and satellite remote sensing techniques	ΓΓΕΤ	01/08/2017	31/05/2019	19.800,00
EUMETSAT Satellite Application Facility on Atmospheric Composition (Third Continuous Development and Operations Phase).	EUMETSAT	01/03/2017	28/02/2022	308.583,00
Monitoring and asessment of regional air quality in China using space observations, project of long-term sino-european co-operation	EU FP7	01/01/2014	31/03/2017	120.000,00
EMRP Researcher Grant, Traceability for atmospheric total column ozone	EURAMET	01/12/2014	30/9/2017	68.540,00
Quality assurance for essential climate variables	FP7-SPACE-2013-1	01/01/2014	31/3/2018	60.000,00
Optimization and application of methods for ground-based remote sensing of aerosols and ozone in the lower troposphere for investigating their variability	ΥΠΕΠΘ	29/5/2018	28/09/2019	72.100,00
Regional climate-air quality interactions	EU FP7	1/12/2013	30/11/2017	104.500,00
Emission models for fugitive particulate matter towards an online emission inventory for the Middle East Area	TEXAS ENGINEERING EXPERIMENT STATION	1/4/2015	31/8/2018	69.946,00
Implementation of a forecAsting System for urban heaT Island	EUROPEAN COMMISSION -	1/9/2018	31/8/2021	183.929,00

effect for the development of urban adaptation strategies	ENVIRONMENT DIRECTORATE GENERAL			
Low Carbon Transport in Cruise Destination Cities	AREA DI RICERCA SCIENTIFICA E TECHNOLOGICA DI TRIESTE- AREA SCIENCE PARK	1/10/2018	30/10/2019	38.000,00
Regenerating mixed-use med urban communities congested by traffic through innovative low carbon mobility solutions.	EUROPEAN REGIONAL DEVELOPMENT FUND (ERDF)	1/11/2016	30/4/2019	362.450,00
Cruise and passenger ship Air quality Impact Mitigation ActioNs (2014-2015	EUROPEAN REGIONAL DEVELOPMENT FUND (ERDF)	1/7/2014	30/6/2015	128,500

Table 1. *Selected publications by members of the Laboratory of Atmospheric Physics, Aristotle University of Thessaloniki, Greece, for the previous five years [2013-2018] sorted by first author.*

First author	Title	Year	Journal	# of citations	DOI
Aber-nethy, R.	State of the climate in 2017	2018	Bulletin of the American Meteorological Society	1	10.1175/2018BAMSStateoftheClimat
Aggelis D.	Mapping of surface ozone seasonality and trends across Europe during 1997-2006 through kriging interpolation to observational data	2013	Water, Air, and Soil Pollution	2	10.1007/s11270-013-1501-9
Akritidis D.	A deep stratosphere-to-troposphere ozone transport event over Europe simulated in CAMS global and regional forecast systems: Analysis and evaluation	2018	Atmospheric Chemistry and Physics		10.5194/acp-18-15515-2018
Alexandri G.	On the ability of RegCM4 regional climate model to simulate surface solar radiation patterns over Europe: An assessment using satellite-based observations	2015	Atmospheric Chemistry and Physics	20	10.5194/acp-15-13195-2015
Alexandri G.	A high resolution satellite view of surface solar radiation over the climatically sensitive region of Eastern Mediterranean	2017	Atmospheric Research	14	10.1016/j.atmosres.2016.12.015
Amiridis V.	LIVAS: A 3-D multi-wavelength aerosol/cloud database based on CALIPSO and EARLINET	2015	Atmospheric Chemistry and Physics	29	10.5194/acp-15-7127-2015
Anastasiou A.	Ultraviolet radiation and effects on humans: The paradigm of maternal Vitamin D production during pregnancy	2017	European Journal of Clinical Nutrition	5	10.1038/ejcn.2016.188

Andrady A.	Environmental effects of ozone depletion and its interactions with climate change: Progress report, 2015	2016	Photochemical and Photobiological Sciences	10	10.1039/c6pp90004f
Andrady A.	Environmental effects of ozone depletion and its interactions with climate change: Progress report, 2016	2017	Photochemical and Photobiological Sciences	10	10.1039/c7pp90001e
Andrady A.L.	Environmental effects of ozone depletion and its interactions with climate change: 2014 assessment Executive summary	2015	Photochemical and Photobiological Sciences	6	10.1039/c4pp90042a
Andrady A.L.	Environmental effects of ozone depletion and its interactions with climate change: 2014 assessment Executive summary	2015	Photochemical and Photobiological Sciences	6	10.1039/c4pp90042a
Bais A.F.	Changes in surface shortwave solar irradiance from 1993 to 2011 at Thessaloniki (Greece)	2013	International Journal of Climatology	7	10.1002/joc.3636
Bais A.F.	Ozone depletion and climate change: Impacts on UV radiation	2015	Photochemical and Photobiological Sciences	80	10.1039/c4pp90032d
Bais A.F.	Environmental effects of ozone depletion, UV radiation and interactions with climate change: UNEP Environmental Effects Assessment Panel, update 2017	2018	Photochemical and Photobiological Sciences	8	10.1039/c7pp90043k
Balis D.	Validation of ash optical depth and layer height retrieved from passive satellite sensors using EARLINET and airborne lidar data: the case of the Eyjafjallajökull eruption	2016	Atmospheric Chemistry and Physics	6	10.5194/acp-16-5705-2016
Benas N.	Surface ozone photolysis rate trends in the Eastern Mediterranean: Modeling the effects of aerosols and total	2013	Atmospheric Environment	6	10.1016/j.atmosenv.2013.03.019

	column ozone based on Terra MODIS data				
Binietoglou I.	A methodology for investigating dust model performance using synergistic EARLINET/AERONET dust concentration retrievals	2015	Atmospheric Measurement Techniques	30	10.5194/amt-8-3577-2015
Boynard A.	Seven years of IASI ozone retrievals from FORLI: Validation with independent total column and vertical profile measurements	2016	Atmospheric Measurement Techniques	16	10.5194/amt-9-4327-2016
Boynard A.	Validation of the IASI FORLI/EUMETSAT ozone products using satellite (GOME-2), ground-based (Brewer-Dobson, SAOZ, FTIR) and ozonesonde measurements	2018	Atmospheric Measurement Techniques	2	10.5194/amt-11-5125-2018
Carboni E.	The vertical distribution of volcanic SO2 plumes measured by IASI	2016	Atmospheric Chemistry and Physics	12	10.5194/acp-16-4343-2016
Coldewey-Egbers M.	The GOME-type Total Ozone Essential Climate Variable (GTO-ECV) data record from the ESA Climate Change Initiative	2015	Atmospheric Measurement Techniques	16	10.5194/amt-8-3923-2015
Colette A.	Is the ozone climate penalty robust in Europe?	2015	Environmental Research Letters	11	10.1088/1748-9326/10/8/084015
Drosoglou T.	Comparisons of ground-based tropospheric NO2 MAX-DOAS measurements to satellite observations with the aid of an air quality model over the Thessaloniki area, Greece	2017	Atmospheric Chemistry and Physics	6	10.5194/acp-17-5829-2017
Drosoglou T.	MAX-DOAS NO2 observations over Guangzhou, China	2018	Atmospheric Measurement Techniques	2	10.5194/amt-11-2239-2018
Efstathiou G.A.	Sensitivity of WRF to boundary layer parameterizations in	2013	Atmospheric Research	30	10.1016/j.atmosres.2013.05.004

	simulating a heavy rainfall event using different microphysical schemes. Effect on large-scale processes				
Efstathiou G.A.	Characteristics of the atmospheric circulation associated with cold-season heavy rainfall and flooding over a complex terrain region in Greece	2014	Theoretical and Applied Climatology	1	10.1007/s00704-013-0899-8
Eleftheratos K.	Ozone variations derived by a chemical transport model	2013	Water, Air, and Soil Pollution	1	10.1007/s11270-013-1585-2
Eleftheratos K.	Ozone and spectroradiometric UV changes in the past 20 years over high latitudes	2015	Atmosphere - Ocean	9	10.1080/07055900.2014.919897
Ermolli I.	Recent variability of the solar spectral irradiance and its impact on climate modelling	2013	Atmospheric Chemistry and Physics	141	10.5194/acp-13-3945-2013
Feidas H.	Modeling and mapping temperature and precipitation climate data in Greece using topographical and geographical parameters	2014	Theoretical and Applied Climatology	14	10.1007/s00704-013-1052-4
Filioglou M.	A sensitivity study of the LIdar-Radiometer Inversion Code (LIRIC) using selected cases from Thessaloniki, Greece database	2018	International Journal of Remote Sensing		10.1080/01431161.2017.1384589
Fountoulakis I.	Projected changes in solar UV radiation in the arctic and sub-arctic oceans: Effects from changes in reflectivity, ice transmittance, clouds, and ozone	2014	Journal of Geophysical Research	8	10.1002/2014JD021918
Fountoulakis I.	Projected changes in erythemal and vitamin D effective irradiance over northern-hemisphere high latitudes	2015	Photochemical and Photobiological Sciences	3	10.1039/c5pp00093a
Fountoulakis I.	Short- and long-term variability of spectral solar UV irradiance at	2016	Atmospheric Chemistry and	14	10.5194/acp-16-2493-2016

	Thessaloniki, Greece: Effects of changes in aerosols, total ozone and clouds		Physics		
Fountoulakis I.	Dead time effect on the Brewer measurements: Correction and estimated uncertainties	2016	Atmospheric Measurement Techniques	8	10.5194/amt-9-1799-2016
Fountoulakis I.	Temperature dependence of the Brewer global UV measurements	2017	Atmospheric Measurement Techniques	4	10.5194/amt-10-4491-2017
Fountoulakis I.	Twenty-five years of spectral UV-B measurements over Canada, Europe and Japan: Trends and effects from changes in ozone, aerosols, clouds, and surface reflectivity	2018	Comptes Rendus - Geoscience		10.1016/j.crte.2018.07.011
Fragkos K.	The effect of three different absorption cross-sections and their temperature dependence on total ozone measured by a mid-latitude brewer spectrophotometer	2015	Atmosphere - Ocean	9	10.1080/07055900.2013.847816
Fragkos K.	Extreme total column ozone events and effects on UV solar radiation at Thessaloniki, Greece	2016	Theoretical and Applied Climatology	10	10.1007/s00704-015-1562-3
Garane K.	Quality assessment of the Ozone-cci Climate Research Data Package (release 2017)-Part 1: Ground-based validation of total ozone column data products	2018	Atmospheric Measurement Techniques	6	10.5194/amt-11-1385-2018
Georgieva I.	High performance computing simulations of the atmospheric composition in Bulgaria and the city of Sofia	2017	Cybernetics and Information Technologies		10.1515/cait-2017-0053
Giannakaki E.	Optical and microphysical characterization of aerosol layers over South Africa by means of multi-wavelength depolarization	2016	Atmospheric Chemistry and Physics	8	10.5194/acp-16-8109-2016

	and Raman lidar measurements				
Giannaros C.	A comprehensive approach for the simulation of the Urban Heat Island effect with the WRF/SLUCM modeling system: The case of Athens (Greece)	2018	Atmospheric Research	4	10.1016/j.atmosres.2017.10.015
Giannaros C.	On the short-term simulation of heat waves in the Southeast Mediterranean: Sensitivity of the WRF model to various physics schemes	2019	Atmospheric Research		10.1016/j.atmosres.2018.11.015
Giannaros T.M.	Numerical study of the urban heat island over Athens (Greece) with the WRF model	2013	Atmospheric Environment	49	10.1016/j.atmosenv.2013.02.055
Giannaros T.M.	Development of an operational modeling system for urban heat islands: An application to Athens, Greece	2014	Natural Hazards and Earth System Sciences	7	10.5194/nhess-14-347-2014
Giannaros T.M.	Evaluation of thermal bioclimate based on observational data and numerical simulations: an application to Greece	2014	International Journal of Biometeorology	6	10.1007/s00484-014-0832-6
Giannaros T.M.	Performance evaluation of the Weather Research and Forecasting (WRF) model for assessing wind resource in Greece	2017	Renewable Energy	14	10.1016/j.renene.2016.10.033
Gkertsi F.	DOAS-based total column ozone retrieval from Phaethon system	2018	Atmospheric Environment		10.1016/j.atmosenv.2018.02.036
Haberreiter M.	A new observational solar irradiance composite	2017	Journal of Geophysical Research: Space Physics	5	10.1002/2016JA023492
Hao N.	GOME-2 total ozone columns from MetOp-A/MetOp-B and assimilation in the MACC system	2014	Atmospheric Measurement Techniques	17	10.5194/amt-7-2937-2014

Hassinen S.	Overview of the O3M SAF GOME-2 operational atmospheric composition and UV radiation data products and data availability	2016	Atmospheric Measurement Techniques	17	10.5194/amt-9-383-2016
Hood L.L.	Solar signals in CMIP-5 simulations: The ozone response	2015	Quarterly Journal of the Royal Meteorological Society	29	10.1002/qj.2553
Huttunen J.	Retrieval of aerosol optical depth from surface solar radiation measurements using machine learning algorithms, non-linear regression and a radiative transfer-based look-up table	2016	Atmospheric Chemistry and Physics	4	10.5194/acp-16-8181-2016
Inness A.	Data assimilation of satellite-retrieved ozone, carbon monoxide and nitrogen dioxide with ECMWF's Composition-IFS	2015	Atmospheric Chemistry and Physics	29	10.5194/acp-15-5275-2015
Ioannidou A.	Time lag between the tropopause height and 7Be activity concentrations on surface air	2014	Journal of Environmental Radioactivity	11	10.1016/j.jenvrad.2013.12.013
Karagiannidis A.	The air quality of a Mediterranean urban environment area and its relation to major meteorological parameters	2015	Water, Air, and Soil Pollution	9	10.1007/s11270-014-2239-8
Katragkou E.	Evaluation of near-surface ozone over Europe from the MACC reanalysis	2015	Geoscientific Model Development	15	10.5194/gmd-8-2299-2015
Kazadzis S.	Long-term series and trends in surface solar radiation in Athens, Greece	2018	Atmospheric Chemistry and Physics	4	10.5194/acp-18-2395-2018
Keppens A.	Quality assessment of the Ozone-cci Climate Research Data Package (release 2017) - Part 2: Ground-based validation of nadir	2018	Atmospheric Measurement Techniques	2	10.5194/amt-11-3769-2018

	ozone profile data products				
Kosmopoulos P.G.	Solar energy prediction and verification using operational model forecasts and ground-based solar measurements	2015	Energy	13	10.1016/j.energy.2015.10.054
Kosmopoulos P.G.	Dust impact on surface solar irradiance assessed with model simulations, satellite observations and ground-based measurements	2017	Atmospheric Measurement Techniques	12	10.5194/amt-10-2435-2017
Kosmopoulos P.G.	Assessment of surface solar irradiance derived from real-time modelling techniques and verification with ground-based measurements	2018	Atmospheric Measurement Techniques	3	10.5194/amt-11-907-2018
Koukouli M.E.	Intercomparison of Metop-A SO2 measurements during the 2010-2011 Icelandic eruptions	2014	Annals of Geophysics	6	10.4401/ag-6613
Koukouli M.E.	Evaluating a new homogeneous total ozone climate data record from GOME/ERS-2, SCIAMACHY/envisat, and GOME-2/MetOp-a	2015	Journal of Geophysical Research	13	10.1002/2015JD023699
Koukouli M.E.	Anthropogenic sulphur dioxide load over China as observed from different satellite sensors	2016	Atmospheric Environment	16	10.1016/j.atmosenv.2016.09.007
Koukouli M.E.	The impact of the ozone effective temperature on satellite validation using the Dobson spectrophotometer network	2016	Atmospheric Measurement Techniques	4	10.5194/amt-9-2055-2016
Koukouli M.E.	Updated SO_2 emission estimates over China using OMI/Aura observations	2018	Atmospheric Measurement Techniques	3	10.5194/amt-11-1817-2018
Kourtidis K.	A study of the hourly variability of the urban heat island effect in the Greater Athens Area during summer	2015	Science of the Total Environment	11	10.1016/j.scitotenv.2015.02.062

Kreuter A.	Solar irradiance in the heterogeneous albedo environment of the Arctic coast: Measurements and a 3-D model study	2014	Atmospheric Chemistry and Physics	12	10.5194/acp-14-5989-2014
Lerot C.	Homogenized total ozone data records from the european sensors gome/ers-2, SCIAMACHY/envisat, and GOME-2/MetOp-A	2014	Journal of Geophysical Research	29	10.1002/2013JD020831
Leventidou E.	Factors affecting the comparisons of planetary boundary layer height retrievals from CALIPSO, ECMWF and radiosondes over Thessaloniki, Greece	2013	Atmospheric Environment	20	10.1016/j.atmosenv.2013.04.007
Lindfors A.V.	Effective aerosol optical depth from pyranometer measurements of surface solar radiation (global radiation) at Thessaloniki, Greece	2013	Atmospheric Chemistry and Physics	13	10.5194/acp-13-3733-2013
Liora N.	The natural emissions model (NEMO): Description, application and model evaluation	2015	Atmospheric Environment	10	10.1016/j.atmosenv.2015.10.014
Liora N.	Impacts of natural emission sources on particle pollution levels in Europe	2016	Atmospheric Environment	10	10.1016/j.atmosenv.2016.04.040
Liora N.	Study of the impact of natural sources on the air quality - Evaluation of a natural emissions model	2016	AIP Conference Proceedings		10.1063/1.4944276
López-Solano J.	Aerosol optical depth in the European Brewer Network	2018	Atmospheric Chemistry and Physics	5	10.5194/acp-18-3885-2018
Marécal V.	A regional air quality forecasting system over Europe: The MACC-II daily ensemble production	2015	Geoscientific Model Development	51	10.5194/gmd-8-2777-2015
Marinou E.	Three-dimensional evolution of Saharan dust transport towards	2017	Atmospheric Chemistry and	26	10.5194/acp-17-5893-2017

	Europe based on a 9-year EARLINET-optimized CALIPSO dataset		Physics		
Markakis K.	MOSESS: A New Emission Model for the Compilation of Model-Ready Emission Inventories-Application in a Coal Mining Area in Northern Greece	2013	Environmental Modeling and Assessment	12	10.1007/s10666-013-9360-8
Matthes K.	Solar forcing for CMIP6 (v3.2)	2017	Geoscientific Model Development	32	10.5194/gmd-10-2247-2017
Merico E.	Atmospheric impact of ship traffic in four Adriatic-Ionian port-cities: Comparison and harmonization of different approaches	2017	Transportation Research Part D: Transport and Environment	8	10.1016/j.trd.2016.11.016
Misios S.	Solar signals in CMIP-5 simulations: Effects of atmosphere-ocean coupling	2016	Quarterly Journal of the Royal Meteorological Society	13	10.1002/qj.2695
Mitchell D.M.	Solar signals in CMIP-5 simulations: The stratospheric pathway	2015	Quarterly Journal of the Royal Meteorological Society	37	10.1002/qj.2530
Nikitidou E.	Retrieval of surface solar irradiance, based on satellite-derived cloud information, in Greece	2015	Energy	3	10.1016/j.energy.2015.07.103
Orphal J.	Absorption cross-sections of ozone in the ultraviolet and visible spectral regions: Status report 2015	2016	Journal of Molecular Spectroscopy	22	10.1016/j.jms.2016.07.007
Papanastasiou D.K.	Air quality and thermal comfort levels under extreme hot weather	2015	Atmospheric Research	27	10.1016/j.atmosres.2014.06.002
Pappalardo G.	Four-dimensional distribution of the 2010 Eyjafjallajökull volcanic cloud over Europe observed by EARLINET	2013	Atmospheric Chemistry and Physics	44	10.5194/acp-13-4429-2013

Peters E.	Investigating differences in DOAS retrieval codes using MAD-CAT campaign data	2017	Atmospheric Measurement Techniques	9	10.5194/amt-10-955-2017
Poupkou A.	A modeling study of the impact of the 2007 Greek forest fires on the gaseous pollutant levels in the Eastern Mediterranean	2014	Atmospheric Research	12	10.1016/j.atmosres.2014.05.015
Pu X.	Enhanced surface ozone during the heat wave of 2013 in Yangtze River Delta region, China	2017	Science of the Total Environment	20	10.1016/j.scitotenv.2017.03.056
Redondas A.	EUBREWNET RBCC-E Huelva 2015 Ozone Brewer Intercomparison	2018	Atmospheric Chemistry and Physics	3	10.5194/acp-18-9441-2018
Schmalwieser A.W.	UV Index monitoring in Europe	2017	Photochemical and Photobiological Sciences	4	10.1039/c7pp00178a
Seckmeyer G.	Why is it so hard to gain enough Vitamin D by solar exposure in the European winter?	2018	Meteorologische Zeitschrift	1	10.1127/metz/2018/0855
Sichletidis L.	Exposure to PM10 as a risk factor for the development of nasal obstruction and chronic obstructive pulmonary disease	2014	International Journal of Occupational and Environmental Health	2	10.1179/2049396713Y.0000000047
Siomos N.	Investigating the quality of modeled aerosol profiles based on combined lidar and sunphotometer data	2017	Atmospheric Chemistry and Physics	4	10.5194/acp-17-7003-2017
Siomos N.	Are EARLINET and AERONET climatologies consistent? the case of Thessaloniki, Greece	2018	Atmospheric Chemistry and Physics		10.5194/acp-18-11885-2018
Solomou E.	Evaluating near-surface ozone levels simulated from MACC global and regional modelling systems in Eastern Mediterranean under the influence of Etesian winds	2018	Atmospheric Research	2	10.1016/j.atmosres.2017.09.010

Sukhodolov T.	Evaluation of simulated photolysis rates and their response to solar irradiance variability	2016	Journal of Geophysical Research	9	10.1002/2015JD024277
Tourpali K.	Winter anticyclonic blocking effects over Europe during 1960-2000 from an ensemble of regional climate models	2013	Climate Research	3	10.3354/cr01169
Tzoumanikas P.	The effect of clouds on surface solar irradiance, based on data from an all-sky imaging system	2016	Renewable Energy	14	10.1016/j.renene.2016.04.026
Van Dijk A.	Skin cancer risks avoided by the Montreal Protocol - Worldwide Modeling Integrating coupled climate-chemistry models with a risk model for UV	2013	Photochemistry and Photobiology	24	10.1111/j.1751-1097.2012.01223.x
Voskrebenzev A.	Estimating probability distributions of solar irradiance	2014	Theoretical and Applied Climatology	4	10.1007/s00704-014-1189-9
Williamson C.E.	Solar ultraviolet radiation in a changing climate	2014	Nature Climate Change	109	10.1038/nclimate2225
Zanis P.	Transient high-resolution regional climate simulation for Greece over the period 1960-2100: Evaluation and future projections	2015	Climate Research	6	10.3354/cr01304
Zempila M.M.	NILU-UV multi-filter radiometer total ozone columns: Comparison with satellite observations over Thessaloniki, Greece	2017	Science of the Total Environment	1	10.1016/j.scitotenv.2017.02.174
Zempila M.M.	Validation of OMI erythemal doses with multi-sensor ground-based measurements in Thessaloniki, Greece	2018	Atmospheric Environment	2	10.1016/j.atmosenv.2018.04.012
Zempila M.-M.	Evaluation of WRF shortwave radiation parameterizations in predicting Global Horizontal Irradiance in Greece	2016	Renewable Energy	13	10.1016/j.renene.2015.08.057

Zempila M.-M.	OMI/Aura UV product validation using NILU-UV ground-based measurements in Thessaloniki, Greece	2016	Atmospheric Environment	13	10.1016/j.atmosenv.2016.06.009
Zempila M.-M.	Modeling the relationship between photosynthetically active radiation and global horizontal irradiance using singular spectrum analysis	2016	Journal of Quantitative Spectroscopy and Radiative Transfer	6	10.1016/j.jqsrt.2016.06.003
Zempila M.-M.	TEMIS UV product validation using NILU-UV ground-based measurements in Thessaloniki, Greece	2017	Atmospheric Chemistry and Physics	6	10.5194/acp-17-7157-2017
Zerefos C.	Representativeness of single lidar stations for zonally averaged ozone profiles, their trends and attribution to proxies	2018	Atmospheric Chemistry and Physics	2	10.5194/acp-18-6427-2018
Zerefos C.S.	Evidence for an earlier greenhouse cooling effect in the stratosphere before 1980 over the Northern Hemisphere	2014	Atmospheric Chemistry and Physics	8	10.5194/acp-14-7705-2014
Zerefos C.S.	Detecting volcanic sulfur dioxide plumes in the Northern Hemisphere using the Brewer spectrophotometers, other networks, and satellite observations	2017	Atmospheric Chemistry and Physics	3	10.5194/acp-17-551-2017
Zyrichidou I.	Evaluation of high resolution simulated and OMI retrieved tropospheric NO2 column densities over Southeastern Europe	2013	Atmospheric Research	18	10.1016/j.atmosres.2012.10.028
Zyrichidou I.	Identification of surface NOx emission sources on a regional scale using OMI NO2	2015	Atmospheric Environment	6	10.1016/j.atmosenv.2014.11.023

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Participation in national networks

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021 (http://panacea-ri.gr/).

Participation in International networks

WCRP (World Climate Research Programme) EURO-CORDEX (Coordinated Downscaling Experiment - European Domain) https://www.euro-cordex.net/

IPCC (Intergovernmental Panel on Climate Change) Working Group I (WGI), Sixth Assessment Report (AR6) - Lead Authors Panel, in Chapter 6
https://archive.ipcc.ch/report/authors

Tropospheric Ozone Assessment Report (TOAR) http://www.igacproject.org/activities/TOAR

Field measurements

Network of meteorological stations. It operates the Aristotle University Meteorological Station since 1930. Additionally, in operation are the Olympus centre (E.K.O.) placed on San Antonios summit (2817 m) in Mount Olympus, and various other weather stations located in the greater Thessaloniki area, listed at https://meteo.geo.auth.gr/en/meteo-obs.

Numerical atmospheric models:

a) WRF (Weather Research and Forecasting Model) https://www.mmm.ucar.edu/weather-research-and-forecasting-model

b) RegCM4 (Regional Climate Model version 4) https://www.ictp.it/research/esp/models/regcm4.aspx

c) Flexpart (FLEXible PARTicle dispersion model) and FLEXTRA (FLEXible TRAjectory model) https://www.flexpart.eu/

d) CAMx (Comprehensive air quality model with extensions) http://www.camx.com/

Climate Services:

a) The DEAR-Clima application tool at http://meteo3.geo.auth.gr:3838/ or http://datahub.geocradle.eu/dataset/dear-clima .

b) GEOCLIMA application tool at https://geoclima.aegean.gr/

Indicative funding

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021, 50.000€.

EU, H2020-SFS-2016-2017, SFS-43-2017, RIA, Pr. Nr. 774652 Enhancing Food Security in AFRIcan AgriCULTUral Systems with the Support of REmote Sensing (Africultures). Duration: 2017- 2021. 278000 €

EU, ECMWF, Copernicus, Global and regional a posteriori validation, including focus on the Arctic and Mediterranean areas (CAMS_84), 2015-2018. 88.000€.

State Scholarship Foundation (IKY) & German Academic Exchange Service (DAAD), Greece-Germany bilateral cooperation (IKYDA 2018) Impact of Land Use Changes on regional and local climate in Europe: present and future climate projections (LUCE), 2018-2019. 10000€

DAAD bilateral cooperation, Justus-Liebig University Giessen and Aristotle University of Thessaloniki, The Mediterranean Hot-Spot: Challenges and Responses in a Changing Environment, 2017-2019.

EUMETSAT Satellite Applications Training, Project Title: Autumn School, Funding Agency: EUMETSAT, 2013-2018.

List of publications over the period 2015-2018

2018

1. Akritidis, D., Katragkou E., Zanis, P., Pytharoulis, I., Melas, D., Flemming, J., Inness, A., Clark, H., Plu, M., and Eskes, H.: A deep stratosphere-to-troposphere ozone transport event over Europe simulated in CAMS global and regional forecast systems: analysis and evaluation,18, Atmos.Chem.Phys.,15515-15534, 2018.
2. Avgoustoglou E., I.T. Matsangouras, I. Pytharoulis, N. Kamperakis, M. Mylonas, P.T. Nastos and H.W. Bluestein, 2018: Numerical modeling analysis of the mesoscale environment conducive to two tornado events using the

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Participation in national networks

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021 (http://panacea-ri.gr/).

Participation in International networks

«A European Brewer Network (EUBREWNET)», Member of the Management Committee, Cost Action ES1207, Coordinator J. Rimmer, University of Manchester, UK, 2013–2017 (http://www.eubrewnet.org/cost1207/)

«**C**opernicus **A**cademy **N**etwork of **Hel**lenic **P**artners (**CAN-HelP**)», member of the Copernicus Academy network (http://lacae.geol.uoa.gr/en/lacae-strategic-partnership/)

Field measurements

Biometeorological in situ measurements and modeling of the urban environment

Indicative funding

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15. Solomos, S., Kalivitis, N., Mihalopoulos, N., Amiridis, V., Kouvarakis, G., Gkikas, A., Binietoglou, I., Tsekeri, A., Kazadzis, S., Kottas, M., Pradhan, Y., Proestakis, E., Nastos, P.T., Marenco, F., 2018, From tropospheric folding to Khamsin and Foehn winds: how atmospheric dynamics advanced a record-breaking dust episode in Crete, Atmosphere 9(7), 240

16. Politi, N., Nastos, P.T., Sfetsos, A., Vlachogiannis, D., Dalezios, N.R., 2018, Evaluation of the AWR-WRF model configuration at high resolution over the domain of Greece, Atmospheric Research 208, 229-245.

17. Nastos, P.T., Papadimou, K.K., Matsangouras, I.T., 2018, Mediterranean tropical-like cyclones: Impacts and composite daily means and anomalies of synoptic patterns, Atmospheric Research 208, 156-166.

18. Mylonas, M.P., Nastos, P.T., Matsangouras, I.T., 2018, PBL parameterization schemes sensitivity analysis on WRF modeling of a tornadic event environment in Skala Lakonia in September 2015, Atmospheric Research 208, 116-131.

19. Founda, D., Nastos, P.T., Pierros, F., Kalimeris, A., 2018, Historical observations of cloudiness (1882–2012) over a large urban area of the

eastern Mediterranean (Athens), Theoretical and Applied Climatology, 1-13, https://doi.org/10.1007/s00704-018-2596-0

20. Rizou, D., Flocas, H.A., Hatzaki, M., Bartzokas, A., 2018, A Statistical Investigation of the Impact of the Indian Monsoon on the Eastern Mediterranean Circulation, Atmosphere 9 (3), 90

21. Kouroutzoglou, J., Avgoustoglou, E.N., Flocas, H.A., Hatzaki, M., Skrimizeas, P., Keay, K., 2018, Assessment of the role of sea surface fluxes on eastern Mediterranean explosive cyclogenesis with the aid of the limited-area model COSMO. GR, Atmospheric Research 208, 132-147

22. Raptis, P.-I., Kazadzis, S., Eleftheratos, K., Amiridis, V., and Fountoulakis, I., 2018, Single scattering Albedo's spectral dependence effect on UV irradiance, Atmosphere, 9, 364, doi:10.3390/atmos9090364.

23. Feloni, E.G., Baltas, E.A., Nastos, P.T., Matsangouras, I.T., 2019, Implementation and evaluation of a convective/stratiform precipitation scheme in Attica region, Greece, Atmospheric Research, 220, 109-119.

Laboratory of Atmospheric Physics – Department of Physics – University of Patras

(complete information is provided in our web site www.atmosphere-upatras.gr/en/)

Participation in national networks

"National Network for the measurement of ultraviolet solar radiation" (http://uvnet.gr/?request=start)

"Hellenic Network of Solar Energy" (https://www.atmosphere-upatras.gr/en/solarmaps).

Associated Member of the Navarino Environmental Observatory (https://www.navarinoneo.se/)

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021 (http://panacea-ri.gr/).

Participation in International networks

Global Network of Isotopes in Precipitation (GNIP) – International Atomic Energy Agency (http://www-naweb.iaea.org/napc/ih/IHS_resources_gnip.html)

Associated Member of the Navarino Environmental Observatory (https://www.navarinoneo.se/)

Field measurements

Meteorological (http://mymeasurements.eu/u/lapup/meteo.php?lang=en) and radiometric (http://mymeasurements.eu/u/lapup/solar.php?lang=en) station at the University of Patras Campus, Patras, Greece.

Airborne particulate matter measuring network, city of Patras (www.patrasair.gr)

Airborne particulate matter measuring network, Municipality of Thermi (www.thermiair.gr)

Indicative funded research projects

EO4GEO: Innovative solutions for Earth Observation/Geoinformation training (H2020 – Erasmus+, http://www.eo4geo.eu/)

PANACEA: Panhellenic infrastructure for atmospheric composition and climate change (GSRT)

ScoSco: Solar Collectors with Static Concentrators, for solar thermal applications at intermediate to medium temperatures (GSRT)

HYMENSO: Middle East – North Africa Hybrid Solar System (ERANETMED Renewable Energies, www.hymenso.eu)

DNICast: Direct Normal Irradiance Nowcasting Methods for Optimized Operation of Concentrating Solar Technologies (FP7, http://www.dnicast-project.net/)

ENORASIS: ENvironmental Optimization of IRrigation Management with the Combined uSe and Integration of High PrecisIon Satellite Data, Advanced Modelling, Process Control and Business Innovation (FP7, http://enorasis.eu/)

CESAPO: Contribution of Emission Sources on the Air quality of the Port-cities in Greece and Italy (ERDF, http://www.cesapo.upatras.gr)

Indicative publications

1. Energy performance of European residential buildings: Energy use, technical and environmental characteristics of the Greek residential sector – energy conservation and CO2 reduction., Gaglia, A.G., Dialynas, E.N., Argiriou, A.A., Kostopoulou, E., Tsiamitros, D., Stimoniaris, D., Laskos, K.M., , Energy and Buildings, 183: 86-104, 2019
2. Determination of the optimal camera distance for cloud height measurements with two all-sky imagers, P. Kuhn, B. Nouri, S. Wilbert, N. Hanrieder, C. Prahl, L. Ramirez, L. Zarzalejo, T. Schmidt, T. Schmidt, Z. Yasser, D. Heinemann, P.Tzoumanikas, A. Kazantzidis, J. Kleissl, P. Blanc, R. Pitz-Paal, Solar Energy, 179, 74-88, 2019.
3. Energy Use Intensities for Asset Rating of Hellenic Non-Residential Buildings , Droutsa, K.G., Balaras, C.A, Daskalaki, E.G., Kontoyiannidis, S., Argiriou, A.A., , Global Journal of Energy Technology Research Updates, (5):19-36, 2018
4. Im U, Brandt J, Geels C, Hansen KM, Christensen JH, Andersen MS, Solazzo E, Kioutsioukis I, Alyuz U, Balzarini A, Baro R, Bellasio R, Bianconi R, Bieser J, Colette A, Curci G, Farrow A, Flemming J, Fraser A, Jimenez-Guerrero P, Kitwiroon N, Liang CK, Nopmongcol U, Pirovano G, Pozzoli L, Prank M, Rose R, Sokhi R, Tuccella P, Unal A, Vivanco MG, West J, Yarwood G, Hogrefe C, Galmarini S, Assessment and economic valuation of air pollution impacts on human health

over Europe and the United States as calculated by a multi-model ensemble in the framework of AQMEII3, Atmospheric Chemistry and Physics, 18: 5967-5989, 2018

5. Astitha M, Kioutsioukis I, Fisseha GA, Bianconi R, Bieser J, Christensen JH, Cooper OR, Galmarini S, Hogrefe C, Im U, Johnson B, Liu P, Nopmongcol U, Petropavlovskikh I, Solazzo E, Tarasick DW, and Yarwood G, Seasonal ozone vertical profiles over North America using the AQMEII3 group of air quality models: model inter-comparison and stratospheric intrusions, Atmospheric Chemistry and Physics, 18: 13925-13945, 2018
6. Galmarini S, Kioutsioukis I, Solazzo E, Alyuz U, Balzarini A, Bellasio R, Benedictow AMK, Bianconi R, Bieser J, Brandt J, Christensen JH, Colette A, Curci G, Davila Y, Dong X, Flemming J, Francis X, Fraser A, Fu J, Henze DK, Hogrefe C, Im U, Garcia Vivanco M, Jiménez-Guerrero P, Jonson JE, Kitwiroon N, Manders A, Mathur R, Palacios-Peña L, Pirovano G, Pozzoli L, Prank M, Schultz M, Sokhi RS, Sudo K, Tuccella P, Takemura T, Sekiya T and Unal A, Two-scale multi-model ensemble: is a hybrid ensemble of opportunity telling us more?, Atmospheric Chemistry and Physics, 18: 8727-8744, 2018
7. Colour Counts: Sunlight and Skin Type as Drivers of Vitamin D Deficiency at UK Latitudes, A.R.Webb, A. Kazantzidis, R.C. Kift, M.D. Farrar, J. Wilkinson, L.E. Rhodes, Nutrients 10, 457; doi:10.3390/nu10040457, 2018.
8. Benchmarking three low-cost, low-maintenance cloud height measurement systems and ECMWF cloud heights against a ceilometer, P. Kuhn, M. Wirtz, N. Killius, S. Wilbert, J.L. Bosch, N. Hanrieder, B. Nouri, J. Kleissl, L. Ramirez, M. Schroedter-Homscheidt, D. Heinemann, A. Kazantzidis, P. Blanc, R. Pitz-Paalj Solar Energy, 168, 140–152, 2018.
9. Meeting Vitamin D Requirements in White Caucasians at UK Latitudes: Providing a Choice, A.R. Webb, A. Kazantzidis, R.C. Kift, M.D. Farrar, J. Wilkinson, L.E. Rhodes, Nutrients, 497; doi:10.3390/nu10040497, 2018.
10. A local binary pattern classification approach for cloud types derived from all-sky imagers, S. Oikonomou, A. Kazantzidis, G. Economou, S. Fotopoulos, International Journal of Remote Sensing, 2018, doi: 10.1080/01431161.2018.1530807
11. The impact of the energy performance regulations' updated on the construction technology, economics and energy aspects of new residential buildings: The case of Greece, 83. Gaglia, A.G., Tsikaloudaki, A.G., Laskos, C.M., Dialynas, E.N., Argiriou, A.A. , Energy & Buildings, 155: 225-237 , 2017
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A. Alebic-Juretic, E. Barbaro, D. Cesari, L. Chasapidis, S. Dimopoulos, A. Dinoi, A. Donateo, C. Giannaros, E. Gregoris, A. Karagiannidis, A.G. Konstandopoulos, T. Ivoševic, N. Liora, D. Melas, B. Mifka, I. Orlic, A. Poupkou, K. Sarovic, A. Tsakis, R. Giua, T. Pastore, A. Nocioni, D. Contini, , Transportation Research Part D, 50: 431-445, 2017

13. High resolution air temperature climatology for Greece for the period 1971 – 2000., A. Mamara, M. Anadranistakis, A.A. Argiriou, T. Szentimrey, T. Kovacs, A. Bezes, Z. Bihari, Meteorol. Appl., 24: 191-205, 2017
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15. Recent trend analysis of mean air temperature in Greece based on homogenized data, A. Mamara, A.A. Argiriou, M. Anadranistakis, , Theor. Appl. Climatol., 126:543-573, 2016
16. Lightning activity in the Mediterranean: quantification of cyclones contribution and relation to their intensity, E. Galanaki, Flaounas E., V. Kotroni, K. Lagouvardos, A. Argiriou , , Atmospheric Science Letters , 17(9):510-516, 2016
17. The effect of clouds on surface solar irradiance, based on data from an all-sky imaging system, P. Tzoumanikas, E. Nikitidou, A.F. Bais, A. Kazantzidis, , Renewable Energy, 95, 314-322, 2016
18. Lightning activities and aerosols in the Mediterranean region, E. Proestakis, S. Kazadzis, K. Lagouvardos, V. Kotroni, A. Kazantzidis, , Atmospheric Research, 170,66-75, 2016
19. Periodicity analysis of d18O in precipitation over Central Europe: Time–frequency considerations of the isotopic ‘temperature’ effect, V. Salamalikis, A.A. Argiriou, E. Dotsika, , Journal of Hydrology, 534:150-163, 2016
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21. Evaluation of WRF shortwave radiation parameterizations in predicting Global Horizontal Irradiance in Greece, Renewable Energy, 86,831-840, 2016
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27. The air quality of a Mediterranean urban environment and its relation to major meteorological parameters, A. Karagiannidis, A. Poupkou, T. Giannaros, C. Giannaros, D. Melas, A. Argiriou , , Water, Air & Soil Pollution, 226:2239, 2015
28. Stable isotopic composition of atmospheric water vapor in Patras, Greece: A concentration weighted trajectory approach, V. Salamalikis, A.A. Argiriou, E. Dotsika, Atmospheric Research, 152:93-104, 2015

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Participation in national networks

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021 (http://panacea-ri.gr/).

Participation in International networks

«Global Coordination of Atmospheric Electricity Measurements (GLOCAEM)», National Environment Research Council (NERC), U.K., 3.2016-2.2019 (https://glocaem.wordpress.com/).

«Atmospheric Electricity Network: coupling with the Earth System, climate and biological systems (ELECTRONET)» (Coordinator), E.U., COST, 11.2016-10.2020 (https://atmospheric-electricity-net.eu/).

Field measurements

XANTHI Site of Atmospheric electricity measurements (continuously operational since 3.2011), listed at https://dataspace.atmospheric-electricity-net.eu/stations/xanthi-station .

Indicative funding

«Monitoring and Assessment of Regional air quality in China using space Observations, Project Of Long-term sino-european co-Operation (MarcoPolo)», E.U., DG TREN Aeronautics and Space, 21.11.2013-20.11.2016, 129.000€.

«Collective awareness platform for outdoor air pollution (HackAir)» E.U., HORIZON 2020 – ICT-2015, 1.2016-12.2018, 50.000€.

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation - EPAnEK), 10.2018-9.2021, 55.000€.

Indicative publications

1. Kourtidis K., A.K. Georgoulias, S. Rapsomanikis, V. Amiridis, I. Keramitsoglou, H. Hooyberghs, B. Maiheu and D. Melas: A study of the hourly variability of the Urban Heat Island effect in the Greater Athens Area during summer, *Sci. Total Env.*, 517C, 162-177, http://dx.doi.org/10.1016/j.scitotenv.2015.02.062, 2015.

2. Kourtidis K., S. Stathopoulos, A. Georgoulias, G. Alexandri, S. Rapsomanikis: A study of the impact of synoptic weather conditions and water vapor on aerosol-cloud relationships over major urban clusters of China, *Atmos. Chem. Phys.*, 15, 10955-10964, doi:10.5194/acp-15-10955-2015, 2015.

3. Kourtidis K., A.K. Georgoulias, M. Vlahopoulou, N. Tsirliganis, N. Kastelis, K. Ouzounis, and N. Kazakis: Radon and radioactivity at a town overlying Uranium ores in northern Greece. *J. of Environmental Radioactivity*, 150, 220-227, 2015.

4. Kastelis N. and K. Kourtidis: Characterisation of the atmospheric electric field and correlation with CO_2 at a rural site in southern Balkans, *Earth, Planets and Space*, 68:3, DOI 10.1186/s40623-016-0379-3, 2016.

5. Georgoulias A.K., G. Alexandri, K. A. Kourtidis, J. Lelieveld, P. Zanis, U. Pöschl, R. Levy, V. Amiridis, E. Marinou, A. Tsikerdekis, Spatiotemporal variability and contribution of different aerosol types to the Aerosol Optical Depth over the Eastern Mediterranean, *Atmos. Chem. Phys.*, 16, 13853-13884, doi:10.5194/acp-16-13853-2016, 2016.

6. De Ridder K., B. Maiheu, D. Lauwaet, I. A. Daglis, I. Keramitsoglou, K. Kourtidis, P. Manunta, M. Paganini, Urban heat island intensification during hot spells – the case of Paris during the summer of 2003, *Urban Science* 1, 3, doi:10.3390/urbansci1010003, 2016.

7. Stathopoulos S., A. K. Georgoulias, K. Kourtidis, Space-borne observations of aerosol - cloud relations for cloud systems of different heights, *Atmos. Res.* 183, 191-201, 2017.

8. Kourtidis K., A. K. Georgoulias, B. Mijling, R. van der A, Q. Zhang, J. Ding: A new method for deriving trace gas emission inventories from satellite observations: The case of SO2 over China, *Science of the Total Environment*, 612, 923–930, 2018.

9. de Leeuw Gerrit, L. Sogacheva, E. Rodriguez, K. Kourtidis, A. K. Georgoulias, G. Alexandri, V. Amiridis, E. Proestakis, E. Marinou, Y. Xue, and R. van der A, Two decades of satellite observations of AOD over mainland China using ATSR-2, AATSR and MODIS/Terra: data set evaluation and large-scale patterns, *Atmos. Chem. Phys.*, 18, 1573-1592, https://doi.org/10.5194/acp-18-1573-2018, 2018.

10. Kosmidis E., P. Syropoulou, S. Tekes, P. Schneider, E. Spyromitros-Xioufis, M. Riga, P. Charitidis, A. Moumtzidou, S. Papadopoulos, S. Vrochidis, I. Kompatsiaris, I. Stavrakas, G. Hloupis, A. Loukidis, K. Kourtidis, A. K. Georgoulias, G. Alexandri: hackAIR: Towards raising Awareness about Air Quality in Europe by developing a Collective Online Platform, *ISPRS Int. J. Geo-Inf.*, 7(5), 187, doi:10.3390/ijgi7050187, 2018.

11. Sogacheva L., G. de Leeuw1, E. Rodriguez, P. Kolmonen, A. K. Georgoulias, G. Alexandri, K. Kourtidis, E. Proestakis, E. Marinou, V. Amiridis, Y. Xue, and R. J.

van der A, Spatial and seasonal variations of aerosols over China from two decades of multi-satellite observations – Part 1: ATSR (1995–2011) and MODIS C6.1 (2000–2017), *Atmos. Chem. Phys.,* 18, 11389-11407, https://doi.org/10.5194/acp-18-11389-2018, 2018.

12. Larisa Sogacheva, E. Rodriguez, P. Kolmonen, T.H. Virtanen, G. Saponaro, G. de Leeuw, A.K. Georgoulias, G. Alexandri, K. Kourtidis, R.J. van der A, Spatial and seasonal variations of aerosols over China from two decades of multi-satellite observations – Part 2: AOD time series for 1995–2017 combined from ATSR ADV and MODIS C6.1 and AOD tendency estimations, *Atmos. Chem. Phys.,* 18, 16631–16652, https://doi.org/10.5194/acp-18-16631-2018, 2018.

13. Nicoll K.A., Harrison R G., V. Barta, J. Bor, R. Brugge, A. Chillingarian, J. Chum, A. K. Georgoulias, A. Guha, K. Kourtidis, M. Kubicki, E. Mareev, J. Matthews, H. Mkrtchyan, A. Odzimek, J.-P. Raulin, D. Robert, H. Silva, J. Tacza, Y. Yair, R. Yaniv, A global atmospheric electricity monitoring network for climate and geophysical research, *Journal of Atmospheric and Solar-Terrestrial Physics*, 184, 18-29, doi.org/10.1016/j.jastp.2019.01.003, 2019.

Laboratory of Meteorology, Department of Physics, University of Ioannina, Ioannina, Greece

Professor Aristides Bartzokas

Publication in peer-reviewed journals (2015-2018)

1. Kaskaoutis, D.G., Rashki, A., Houssos, E.E., Mofidi, A., Goto, D., Bartzokas, A., Francois, P., Legrand, M. (2015): Meteorological aspects associated with dust storms in the Sistan region, southeastern Iran. *Climate Dynamics*, 45, 407-424.
2. Sindosi, O.A., Bartzokas, A., Kotroni, V., Lagouvardos, K. (2015): Influence of orography on precipitation amount and distribution in NW Greece; a case study. *Atmospheric Research*, 152, 105-122.
3. Rizou, D., Flocas, H.A., Athanasiadis, P., Bartzokas, A. (2015): Relationship between the Indian summer monsoon and the large-scale circulation variability over the Mediterranean. *Atmospheric Research*, 152, 159-169.
4. Gkikas, A., Houssos, E.E., Lolis, C.J., Bartzokas, A., Mihalopoulos, N., Hatzianastassiou N. (2015): Atmospheric circulation evolution related to desert dust episodes over the Mediterranean. *Quarterly Journal of the Royal Meteorological Society*, 141 (690), 1634-1645.
5. Moustris, K.P., Nastos, P.T., Bartzokas, A., Larissi, I.K., Zacharia, P.T., Paliatsos, A.G. (2015): Energy consumption based on heating/cooling degree days within the urban environment of Athens, Greece. *Theoretical and Applied Climatology*, 122, 517-529.
6. Dafis, S., Lolis, C.J., Houssos, E.E., Bartzokas A. (2015): The atmospheric circulation characteristics favoring snowfall in an area with complex relief in northwestern Greece. *International Journal of Climatology*, 36 (10), 3561-3577.
7. Gaitanis, G., Lolis, C.J., Tsartsarakis, A., Kalogeropoulos, C., Levidiotou-Stefanou, S., Bartzokas, A., Bassukas, I.D. (2016): An aggregate of four anthrax cases during the dry summer 2011 in Epirus, Greece. *Dermatology*, 232 (1), 112-116.
8. Kaskaoutis, D.G., Houssos, E.E., Rashki, A., Francois, P., Legrand, M., Goto, D., Bartzokas, A., Kambezidis, H.D., Takemura, T. (2016): The Caspian Sea – Hindu

Kush Index (CasHKI): a regulatory factor for dust activity over southwest Asia. *Global and Planetary Change*, 137, 10-23.

9. Hatzianastassiou, N., Papadimas, C.D., Lolis, C.J., Bartzokas, A., Levizzani, V., Pnevmatikos, J.D.†, Katsoulis, B.D. (2016): Spatial and temporal variability of precipitation over the Mediterranean Basin based on 32-year satellite Global Precipitation Climatology Project data. Part-I: Evaluation and climatological patterns. *International Journal of Climatology*, 36, 4741-4754.
10. Hatzianastassiou, N., Papadimas, C.D., Lolis, C.J., Bartzokas, A., Levizzani, V., Pnevmatikos, J.D.†, Katsoulis, B.D. (2016): Spatial and temporal variability of precipitation over the Mediterranean Basin based on 32-year satellite Global Precipitation Climatology Project data. Part-II: Inter-annual variability and trends. *International Journal of Climatology*, 36, 4755-4766.
11. Petcu, D., Iuhasz, G., Pop, D., Talia, D., Carretero, J., Prodan, R., Fahringer, T., Grasso, I., Doallo, R., Martin, M., Fraguela, B.B., Trobec, R., Depolli, M., Rodriguez, F.A., De Sande, F., Da Costa, G., Pierson, J.-M., Anastasiadis, S., Bartzokas, A., Lolis, C., Goncalves, P., Brito, F., Brown, N. (2016): On processing extreme data. *Scalable Computing: Practice and Experience*, 16 (4), 467-489.
12. Dafis, S., Lagouvardos, K., Kotroni, V., Giannaros, T.M., Bartzokas, A. (2017): Observational and modelling study of a mesoscale convective system during the HYMEX - SOP1. *Atmospheric Research*, 187, 1-15.
13. Kaskaoutis, D.G., Rashki, A., Houssos, E.E., Legrand, M., Francois, P., Bartzokas, A., Kambezidis, H.D., Dumca, U.C., Goto, D., Takemura, T. (2017): Assessment of changes in atmospheric dynamics and dust activity over southwest Asia using the Caspian Sea - Hindu Kush Index. *International Journal of Climatology*, 37 (Suppl. 1), 1013-1034.
14. Tsabouri, S., Gkoutsias, A., Lolis, C.J., Makis, A., Chaliasos, B., Bartzokas A. (2018): Impact of meteorological factors on the emergence of bronchiolitis in Northwestern Greece. *Allergologia et Immunopathologia*, 46 (1), 24-30.
15. Gatidis, C., Lolis, C.J., Lagouvardos, K., Kotroni, V., Bartzokas, A. (2018): On the seasonal variability and the spatial distribution of lightning activity over the broader Greek area and their connection to atmospheric circulation. *Atmospheric Research*, 208, 180-190.
16. Ioannidis, E., Lolis, C.J., Papadimas, C.D., Hatzianastassiou, N., Bartzokas, A. (2018): On the intra-annual variation of cloudiness over the Mediterranean region. *Atmospheric Research*, 208, 246-256.

17. Rizou, D., Flocas, H.A., Hatzaki, M., Bartzokas, A. (2018): A statistical investigation of the impact of the Indian monsoon on the eastern Mediterranean circulation. *Atmosphere*, 9 (3), 90, 1-27, doi:10.3390/atmos9030090.
18. Lytra, A.V., Bartzokas, A., Darula, S., Markou, M.T. (2018): Determination of diurnal daylight courses for a central European region. *Solar Energy*, 169, 441-449.
19. Christofilakis, V., Tatsis, G., Votis, C.T., Chronopoulos, S.K., Kostarakis, P., Lolis, C.J., Bartzokas, A. (2018): Rainfall measurements due to radio frequency signal attenuation at 2 GHz. *Journal of Signal and Information Processing*, 9, 192-201.
20. Lolis, C.J., Kotsias, G., Bartzokas, A. (2018): Objective definition of climatologically homogeneous areas in the southern Balkans based on the ERA5 data set. *Climate*, 6, 96, doi:10.3390/cli6040096.

Recent Research Projects

Fire Danger Prevention Platform - OFIDIA

Countries: Greece – Italy

Time period: 2013-15

Collaborators: Euro-Mediterranean Center for Climate Change, University of Ioannina, Decentralized Administration of Epirus and Western Macedonia, Province of Lecce, Province of Bari

Funding: EU, Greece (European Territorial Cooperation Programme "Greece - Italy 2007-2013")

Ionian-Adriatic earLy wARning Monitoring System - i-ALARMS

Countries: Greece – Albania

Time period: 2018-20

Collaborators: University of Ioannina, National Observatory of Athens, Municipality of Corfu, Municipality of Vlora, Aarhus Information Centre Vlora

Funding: EU, Greece, Albania (Cross-Border Cooperation Programme "Greece-Albania 2014-2020")

Operational FIre Danger preventIon platform - Ofidia 2

Countries: Greece – Italy

Collaborators: University of Ioannina, Decentralized Administration of Epirus and Western Macedonia, Euro-Mediterranean Center for Climate Change, Puglia Region – Civil Protection Section.

Time period: 2018-2020

Funding: EU, Greece, Albania (Interreg V-A "Greece-Italy Programme 2014-2020")

Laboratory of Laser Remote Sensing of the Atmosphere, Dept. of Physics, National Technical University of Athens

Participation in national networks

«Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Operational Programme Competitiveness, Enterpreneurship and Innovation-EPAnEK), 2018-2021 (http://panacea-ri.gr/).

Participation in International networks

«ACTRIS II: Aerosols, Clouds, and Trace gases Research InfraStructure Network», EU Integrating Activities (IA), Horizon2020, 2015-2019 (www.actris.eu).

World Meteorological Organization-Global Atmospheric Watch (WMO-GAW)-Aerosol Lidar Observation Network (GALION) (Zografou-Athens station) (http://www.wmo.int/pages/prog/arep/gaw/aerosol.html).

Field measurements

Zografou-Athens Site for aerosol in situ and aerosol/water vapor/ozone laser remote sensing (operational since 05.2000)-Laboratory of Laser Remote Sensing of the Atmosphere, NTUA (http://lrsu.physics.ntua.gr/en).

Indicative funding

1. «ACTRIS II: Aerosols, Clouds, and Trace gases Research InfraStructure Network», EU Integrating Activities (IA), Horizon2020, 2015-2019, 30.000 €.

2. «Panhellenic infrastructure for atmospheric composition and climate change (PANACEA)», Ministry of Economy and Development (Reinforcement of the Research and Innovation Infrastructure, Operational Programme Competitiveness, Enterpreneurship and Innovation, under the call RESEARCH – CREATE - INNOVATE - EPAnEK), 2018-2021, 350.000 €.

3. «Development of an innovative operational 3D Scanning LIDAR system for real-time meteorological and atmospheric measurements in order to increase safety and efficiency in the aviation and transportation industry (SAFE TRANS)», Ministry of Education, Research and Religious Affairs, Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE, EPAnEK), 2018-2021, 155.987,50 €.

4. «Development of a Novel High Spectral Resolution Lidar for Air Pollution Monitoring (CHARISM)», Ministry of Education, Research and Religious Affairs, Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE, EPAnEK), 2018-2021, 12.080 €.

Indicative publications

1. V. Amiridis, E. Marinou, A. Tsekeri, U. Wandinger, A. Schwartz, E. Giannakaki, R. Mamouri, P. Kokkalis, I. Binietoglou, S. Solomos, T. Herekakis, S. Kazadzis, E. Gerasopoulos, D. Balis, A. Papayannis, C. Kontoes, K. Kourtidis, N. Papagiannopoulos, L. Mona, G. Pappalardo, O. Le Rille, and A. Ansmann, LIVAS: a 3D multi-wavelegnth aerosol/cloud global climatology based on CALIPSO and EARLINET, Atmospheric Chemistry and Physics, 15, 7127-7153, 2015.
2. Binietoglou, S. Basart, L. Alados-Arboledas, V. Amiridis, A. Argyrouli, H. Baars, J. M. Baldasano, D. Balis, L. Belegante, J. A. Bravo-Aranda, P. Burlizzi, V. Carrasco, A. Chaikovsky, A. Comerón, G. D'Amico, M. Filioglou, M. J. Granados-Muñoz, J. L. Guerrero-Rascado, L. Ilic, P. Kokkalis, A. Maurizi, L. Mona, F. Monti, C. Muñoz-Porcar, D. Nicolae, A. Papayannis, G. Pappalardo, G. Pejanovic, S. N. Pereira, M. R. Perrone, A. Pietruczuk, M. Posyniak, F. Rocadenbosch, A. Rodríguez-Gómez, M. Sicard, N. Siomos, A. Szkop, E. Terradellas, A. Tsekeri, A. Vukovic, U. Wandinger and J. Wagner, A methodology for investigating dust model performance using synergistic EARLINET/AERONET dust concentration retrievals, Atmospheric Measurements Techniques (Special issue), 8, 3577–3566, 2015.
3. S. Samaras, D. Nicolae, C. Bökckmann, J. Vasilescu, I. Binietoglou, L. Labzovskii, F. Toanca and A. Papayannis, Using Raman-lidar-based regularized microphysical retrievals and Aerosol Mass Spectrometer measurements for the characterization of biomass burning aerosols, Journal of Computational Physics, 299, 156–174, 2015.
4. 4. M. Sicard, G. D'Amico, A. Comerón, L. Mona, L. Alados-Arboledas, A. Amodeo, H. Baars, L. Belegante, I. Binietoglou, J. A. Bravo-Aranda, A. J.

Fernández, P. Fréville, D. García-Vizcaíno, A. Giunta, M. J. Granados-Muñoz, J. L. Guerrero-Rascado, D. Hadjimitsis, A. Haefele, M. Hervo, M. Iarlori, P. Kokkalis, D. Lange, R. E. Mamouri, I. Mattis, F. Molero, N. Montoux, A. Muñoz, C. Muñoz Porcar, F. Navas-Guzmán, D. Nicolae, A. Nisantzi, N. Papagiannopoulos, A. Papayannis, S. Pereira, J. Preißler, M. Pujadas, V. Rizi, F. Rocadenbosch, K. Sellegri, V. Simeonov, G. Tsaknakis, F. Wagner, and G. Pappalardo, EARLINET: Potential operationality of a research network, Atmospheric Measurements Techniques (Special issue), 8, 4587-4613, doi:10.5194/amt-8-4587-2015, 2015.

5. R. Banks, S. Jordi Tiana-Alsina, J. M. Baldasano, F. Rocadenbosch, A. Papayannis, S. Solomos, C. G. Tzanis, Sensitivity of boundary-layer variables to PBL schemes in the WRF model based on surface meteorological observations, lidar, and radiosondes during the HygrA-CD campaign, Atmospheric Research, 176-177, 185-201, 2016.

6. A. Bougiatioti, S. Bezantakos, I. Stavroulas, N. Kalivitis, P. Kokkalis, G. Biskos, N. Mihalopoulos, A. Papayannis, and A. Nenes, Influence of biomass burning on CCN number and hygroscopicity during summertime in the Eastern Mediterranean, Atmospheric Chemistry and Physics (Special Issue), 16, 7389-7409, 2016.

7. A. Chaikovsky, Dubovik, O., Holben, B., Bril, A., Goloub, P., Tanré, D., Pappalardo, G., Wandinger, U., Chaikovskaya, L., Denisov, S., Grudo, Y., Lopatin, A., Karol, Y., Lapyonok, T., Amiridis, V., Ansmann, A., Apituley, A., Allados-Arboledas, L., Binietoglou, I., Boselli, A., D'Amico, G., Freudenthaler, V., Giles, D., Granados-Muñoz, M. J., Kokkalis, P., Nicolae, D., Oshchepkov, S., Papayannis, A., Perrone, M. R., Pietruczuk, A., Rocadenbosch, F., Sicard, M., Slutsker, I., Talianu, C., De Tomasi, F., Tsekeri, A., Wagner, J., and Wang, X.: Lidar-Radiometer Inversion Code (LIRIC) for the retrieval of vertical aerosol properties from combined lidar/radiometer data: development and distribution in EARLINET, Atmospheric Measurements Techniques, 9, 1181-1205, doi:10.5194/amt-9-1181-2016, 2016.

8. M. J. Granados-Muñoz, F. Navas-Guzmán, J. L. Guerrero-Rascado, J. A. Bravo-Aranda, I. Binietoglou, S. N. Pereira, S. Basart, J. M. Baldasano, L. Belegante, A. Chaikovsky, A. Comerón, G. D'Amico, O. Dubovik, L. Ilic, P. Kokkalis, C. Muñoz-Porcar, S. Nickovic, D. Nicolae, F. J. Olmo, A. Papayannis, G. Pappalardo, A. Rodríguez, K. Schepanski, M. Sicard, A. Vukovic, U. Wandinger, F. Dulac, and L. Alados-Arboledas, Profiling of aerosol microphysical properties at several EARLINET/AERONET sites during July 2012 ChArMEx/EMEP campaign, Atmospheric Measurements Techniques

Discussions, (Special Issue), Atmospheric Chemistry and Physics, 16, 7043-7066, 2016.

9. J.A. Bravo-Aranda, L. Belegante, V. Freudenthaler, L. Alados-Arboledas, D. Nicolae, A. Amodeo A., G. D'Amico, R. Engelmann, G. Pappalardo, P. Kokkalis, R. Mamouri, A. Papayannis, S.N. Pereira, and U. Wandinger, Assessment of lidar depolarization uncertainties by means of lidar polarizing sensitivity simulator, Atmospheric Measurements Techniques, (Special Issue), 9, 4935-4953, 2016, doi: 10.5194/amt-9-4935-2016.

10. A. Papayannis, A. Argyrouli, A. Bougiatioti, E. Remoundaki, S. Vratolis, A. Nenes, S. Solomos, M. Komppula, E. Giannakaki, J. Kalogiros, R. Banks, K. Eleftheriadis, E. Mantas, E. Diapouli, C. G. Tzanis, S. Kazadzis, I. Binietoglou, L. Labzovskii, J. Vande Hey, and C. S. Zerefos, An overview from hygroscopic aerosols to cloud droplets: The HygrA-CD Campaign in the Athens basin, Science of the Total Environment, 574, 216-233, 2017. doi: 10.1016/j.scitotenv.2016.09.054.

11. P. Kokkalis, V. Amiridis, J.D. Allan, A. Papayannis, S. Solomos, I. Binietoglou, A. Bougiatioti, A. Tsekeri, A. Nenes, P.D. Rosenberg, F. Marenco, E. Marinou, J. Vasilescu, D. Nicolae, H. Cow, A. Bacak, A. Chaikovcky, Validation of LIRIC aerosol concentration retrievals using airborne measurements during a biomass burning episode over Athens, Atmospheric Research, 183, 255-267, 2017.

12. A. Bougiatioti, Argyrouli, A., Solomos, S., Vratolis, S., Eleftheridadis, K., Papayannis, A., and Nenes, A., CCN activity, variability and influence on droplet formation during the HygrA-CD campaign in Athens, Atmosphere, 8, 108; doi:10.3390/atmos8060108, 2017.

13. S. Jansson, Brydegaard, M., Papayannis, A., Tsaknakis, G., Åkesson, S., Exploitation of an atmospheric lidar network node in single-shot mode for the classification of aerofauna. Journal of Applied Remote Sensing-SPIE, 11, 036009, 2017, http://dx.doi.org/10.1117/1.JRS.11.036009.

14. A. Pantazis, Papayannis, A., Georgoussis, G., Novel lidar algorithms for atmospheric slant-range visibility, meteorological conditions detection and atmospheric layering measurements, Applied Optics, 56, 6440-6449, 2017, doi.org/10.1364/AO.56.006440 (featured as an Editor's pick).

15. S. Vratolis, P. Fetfatzis, A. Argyrouli, A. Papayannis, D. Müller, I. Veselovskii, A. Bougiatioti, A. Nenes, E. Remoundaki, E. Diapouli, M. Manousakas, M. Mylonaki, K. Eleftheriadis, A new method to retrieve the real part of the equivalent refractive index of atmospheric aerosols, Journal of Aerosol Science, 117, 54-62, 2018.

16. L. Labzovskii, Papayannis, A., Binietoglou, I., Banks, R.F., Baldasano, J.M., Toanca, F., Tzanis, C., Christodoulakis, J., Relative humidity vertical profiling using lidar-based synergistic methods in the framework of the Hygra-CD campaign, Annales Geophysicae, 36, 213-229, 2018.

17. L. Belegante, J. A. Bravo-Aranda, Vo. Freudenthaler, D. Nicolae, A. Nemuc, D. Ene, L. Alados-Arboledas, A. Amodeo, G. Pappalardo, G. D'Amico, F. Amato, R. Engelmann, H. Baars, U. Wandinger, A. Papayannis, P. Kokkalis, and S. N. Pereira, Experimental techniques for the calibration of lidar depolarization channels in EARLINET, Atmospheric Measurement Techniques, 11, 1119-1141, 2018.

18. N. Siomos, D. Balis, K-A.Voudouri, E. Giannakaki, M. Filioglou, V. Amiridis, A. Papayannis, and K. Fragkos, Are EARLINET and AERONET climatologies consistent? The case of Thessaloniki, Greece. Atmospheric Chemistry and Physics, 18, 11885-11903, 2018.

19. O. Soupiona, A. Papayannis, P. Kokkalis, M. Mylonaki, G. Tsaknakis, A. Argyrouli, and S. Vratolis, Long-term systematic profiling of dust aerosol optical properties using the EOLE NTUA lidar system over Athens, Greece (2000-2016), Atmospheric Environment , 183, 165-184, 2018.

20. A. Pantazis, Papayannis, A., Georgoussis, G., Lidar algorithms and technique in 3D scanning for atmospheric layering and Planetary Boundary Layer height retrieval. Comparison with other techniques, Applied Optics, 57, 8199-8211, 2018.

21. N. Papagiannopoulos, L. Mona, A. Amodeo, G. D'Amico, P. Gumà Claramunt, G. Pappalardo1, L. Alados-Arboledas, J.L. Guerrero-Rascado, V. Amiridis, A. Apituley, H. Baars, A. Scwharz, U. Wandinger, I. Binietoglou, D. Nicolae, D. Bortoli, P. Kokkalis, A. Papayannis, A. Rodriguez-Gómez, M. Sicard, M. Wiegner and A. Comerón, An automatic observation-based typing method for EARLINET, Atmospheric Chemistry and Physics, 18, 15879-15901, 2018.

Hellenic national Meteorological Service / HNMS

Participation in national and collaborative projects (in national, regional and European level)

- Development of the First Digital Climate Atlas of Greece (http://climatlas.hnms.gr, contact person: from HNMS, Dr. Anna Mamara, anna.mamara@hnms.gr).

- Participation of Hellenic National Meteorological Service / HNMS in NFOFRAS – National Forest Fire Risk Assessment System/Phase A'. A si-cluster collaborated project (in the framework of Hellenic Space Technologies and Applications), leading by ''ATHENA'' Research and Innovation Center, in Information, Communication and Knowledge Technologies, 2014-2015. (https://www.athena-spu.gr/projects/NFOFRAS).

- Participation of Hellenic National Meteorological Service – HNMS / Ministry of Defense, as partner in EU-CIRCLE project – www.eu-circle.eu

This European H2020 project is related to a pan-European framework for strengthening Critical Infrastructure resilience to climate change. Start date: 01/06/2015, end date: 31/05/2018, leading by the National Center of Scientific Research Demokritos / Greece. (Scientific Advisor from HNMS: Nicholas Karatarakis – karatarakis@hnms.gr, Responsible / contact person from HNMS: Dr. Tina Mita – tinamita@hnms.gr).

- Participation of Hellenic National Meteorological Service – HNMS / Ministry of Defense, as partner in the project SAFE TRANS (Safe-efficient Transportation)

SAFE TRANS Development of an innovative operational 3D Scanning LIDAR system for real-time meteorological and atmospheric measurements, in order to increase safety and efficiency in the aviation and transportation industry (contact person from HNMS: Maria Michelaraki, clima@hnms.gr). The project is n progress.

Participation in Regional Climate Forums (RCOFs)

- Contribution to the South East European Climate Outlook (SEECOF) (http://www.seevccc.rs)

- Contribution to the Mediterranean Climate Outlook (MedCOF) (http://medcof.aemet.es/)

Participation in / Contribution to WMO authoritative reports

- Contribution to WMO Annual Bulletin on Climate in WMO/RA VI (https://library.wmo.int/index.php?lvl=notice_display&id=13669)
- Contribution to WMO Annual Statement on the Status of the Global Climate

(https://public.wmo.int/en/our-mandate/climate/wmo-statement-state-of-global-climate)

- World Climate Data and Monitoring Programme WCDMP

(http://www.wmo.int/pages/prog/wcp/wcdmp/index_en.php)

Participation in Regional (European/Sub-European) / International centers, networks, systems etc.

«Drought Management Centre for Southeastern Europe (DMCSEE)», UNCCD-WMO, Environmental Agency of Slovenia (http://www.dmcsee.org/en/home/)

Participation of Hellenic National Meteorological Service – HNMS as partner in the EFAS (European Flood Awareness System). The European Flood Awareness System (EFAS) aims to support preparatory measures before major flood events strike, particularly in the large trans-national river basins and throughout Europe in general. EFAS issues flood warnings for several areas of Greece when needed, according to flood modeling forecasts. EFAS is operational for Greece since 2016.

Indicative publications

1. Skrimizeas P. and A. Papakrivou, 2015: «Stochastic forecasts and extreme weather events. The case study of intense and devastating rains over NW Greece during 30/1-1/2/2015», Poster *Presentation "Using ECMWF's Forecasts" (UEF) Workshop, ECMWF, Reading UK, 8-10/6/2015.*
2. Mamara A, Argiriou AA, Anadranistakis M. 2016. Homogenization of Precipitation Series in Greece. In: Karacostsas T, Bais A, Nastos P. (eds) Perspectives on Atmospheric Sciences. Springer Atmospheric Sciences,Springer, Cham, pp 583-590. https://doi.org/10.1007/978-3-319-35095-0_83.

3. Anadranistakis M, Mamara A, Argiriou AA. 2016. Spatial analysis of the air temperature in Greece for the Normal Period 1971-2000. In: Karacostas T, Bais A, Nastos P. (eds) Perspectives on Atmospheric Sciences. Springer Atmospheric Sciences. Springer, Cham, pp 509-514. https://doi.org/10.1007/978-3-319-35095-0_73.

4. A. Mamara, M. Anadranistakis, AA Argiriou. 2017. Homogenization and gridding of the Greek climate series. WMO, World Climate Data and Monitoring Programme WCDMP-No. 85, (http://www.wmo.int/pages/prog/wcp/wcdmp/wcdmp_series/WCDMP_85.pdf).

5. Mamara A, Anadranistakis M, Argiriou AA, Szentimrey T, Kovacs T, Bezes A, Bihari Z. 2017. High Resolution Air Temperature Climatology for Greece and for the period 1971-2000. Meteorological Applications, 24, 2, pp 191-205.

6. Ch. Lamaris, A. Papakrivou, V. Gerogiannis, S. Tsiougkos and P. Skrimizeas, 2018: «The case of severe weather in Greece on 16 and 17 July 2017 - Evaluation of the prognostic guidance provided by ECMWF and COSMO numerical weather models», 14th International Conference on Meteorology, Climatology and Atmospheric Physics, 15-18 October 2018, Alexandroupoli, Greece.

7. El. Tsiniari, S. Tsiougkos, A. Papakrivou, Kl. Tsioutra, P. Senarelis and P. Skrimizeas, 2018: «Study of the synoptic environment of the specific weather incident on the 16th and the 17th July 2017», 14th International Conference on Meteorology, Climatology and Atmospheric Physics, 15-18 October 2018, Alexandroupoli, Greece.

8. Anastasia Papakrivou: The development of agrometeorological science in Greece, *Biological Rhythm Research*, 50:2, 309-322, https://doi.org/10.1080/09291016.2018.1518871, 2018.

Γ/1

Participation in National Projects

- Development of the First Digital Climate Atlas of Greece (http://climatlas.hnms.gr)

Participation in Regional Climate Forums (RCOFs)

- Contribution to the South East European Climate Outlook (SEECOF) (http://www.seevccc.rs)
- Contribution to the Mediterranean Climate Outlook (MedCOF) (http://medcof.aemet.es/)

Participation in / Contribution to WMO authoritative reports

- Contribution to WMO Annual Bulletin on Climate in RA VI (https://library.wmo.int/index.php?lvl=notice_display&id=13669)
- Contribution to WMO Annual Statement on the Status of the Global Climate (https://public.wmo.int/en/our-mandate/climate/wmo-statement-state-of-global-climate)
- World Climate Data and Monitoring Programme WCDMP (http://www.wmo.int/pages/prog/wcp/wcdmp/index_en.php)

Indicative publications

1. Mamara, M. Anadranistakis, AA Argiriou. 2017. Homogenization and gridding of the Greek climate series. WMO, World Climate Data and Monitoring Programme WCDMP-No. 85, (http://www.wmo.int/pages/prog/wcp/wcdmp/wcdmp_series/WCDMP_85.pdf).
2. Mamara A, Anadranistakis M, Argiriou AA, Szentimrey T, Kovacs T, Bezes A, Bihari Z. 2017. High Resolution Air Temperature Climatology for Greece and for the period 1971-2000. Meteorological Applications, 24, 2, pp 191-205.
3. Mamara A, Argiriou AA, Anadranistakis M. 2016. Homogenization of Precipitation Series in Greece. In: Karacostsas T, Bais A, Nastos P. (eds) Perspectives on Atmospheric Sciences. Springer Atmospheric Sciences,Springer, Cham, pp 583-590. https://doi.org/10.1007/978-3-319-35095-0_83.
4. Anadranistakis M, Mamara A, Argiriou AA. 2016. Spatial analysis of the air temperature in Greece for the Normal Period 1971-2000. In: Karacostas T, Bais A, Nastos P. (eds) Perspectives on Atmospheric Sciences. Springer Atmospheric Sciences. Springer, Cham, pp 509-514. https://doi.org/ 10.1007/978-3-319-35095-0_73.

Γ/2

Participation of HNMS in the **project SAFE TRANS (Safe-efficient Transportation)**
SAFE TRANS Development of an innovative operational 3D Scanning LIDAR system for real-time meteorological and atmospheric measurements, in order to increase safety and efficiency in the aviation and transportation industry. Start:

SAFE TRANS Τίτλος (Ελληνικά) Ανάπτυξη καινοτόμου επιχειρησιακού συστήματος LIDAR τρισδιάστατης (3D) καταγραφής μετεωρολογικών και ατμοσφαιρικών παραμέτρων σε πραγματικό χρόνο, με στόχο την αύξηση της ασφάλειας και της αποδοτικότητας των αερομεταφορών.

Τίτλος (Αγγλικά) Development of an innovative operational 3D Scanning LIDAR system for real-time meteorological and atmospheric measurements in order to increase safety and efficiency in the aviation and transportation industry.

Γ/3

Dept. of Agrometeorology
Hellenic National Meteorological Service
Participation in national networks

Participation in International networks
«Drought Management Centre for Southeastern Europe (DMCSEE)», UNCCD-WMO, Environmental Agency of Slovenia (http://www.dmcsee.org/en/home/).

«Commission for Agricultural Meteorology (CAgM) - WMO » (contact point for Greece) World Meteorological Organization, Geneva, Switzerland (http://www.wmo.int/pages/prog/wcp/agm/cagm/cagm_en.php)

Field measurements

Indicative funding

Indicative publications
Skrimizeas P. and A. Papakrivou, 2015: «Stochastic forecasts and extreme weather events. The case study of intense and devastating rains over NW Greece during 30/1-1/2/2015», Poster *Presentation "Using ECMWF's Forecasts" (UEF) Workshop, ECMWF, Reading UK, 8-10/6/2015.*
Ch. Lamaris, A. Papakrivou, V. Gerogiannis, S. Tsiougkos and P. Skrimizeas, 2018: «The case of severe weather in Greece on 16 and 17 July 2017 - Evaluation of the prognostic guidance provided by ECMWF and COSMO numerical weather models», 14th International Conference on Meteorology, Climatology and Atmospheric Physics, 15-18 October 2018, Alexandroupoli, Greece.
El. Tsiniari, S. Tsiougkos, A. Papakrivou, Kl. Tsioutra, P. Senarelis and P. Skrimizeas, 2018: «Study of the synoptic environment of the specific weather incident on the 16th and the 17th July 2017», 14th International Conference on Meteorology, Climatology and Atmospheric Physics, 15-18 October 2018, Alexandroupoli, Greece.
Anastasia Papakrivou: The development of agrometeorological science in Greece, *Biological Rhythm Research*, 50:2, 309-322, https://doi.org/10.1080/09291016.2018.1518871, 2018.

Γ/4
Participation of Hellenic National Meteorological Service – HNMS as partner in the EFAS (European Flood Awareness System). The European Flood Awareness System (EFAS) aims to support preparatory measures before major flood events strike, particularly in the large trans-national river basins and throughout Europe in general. EFAS issues flood warnings for several areas of Greece when needed, according to flood modeling forecasts. EFAS is operational for Greece since 2016.

Διευθυντής
Participation in projects and programs regarding climate change and other issues in cooperation with other partners
Participation of Hellenic National Meteorological Service – HNMS / Ministry of Defense, as partner in EU-CIRCLE project – www.eu-circle.eu (Scientific Advisor from HNMS: Nicholas Karatarakis – karatarakis@hnms.gr, Responsible / contact person from HNMS: Dr. Tina Mita – tinamita@hnms.gr). This European H2020 project is related to a pan-European framework for strengthening Critical Infrastructure

resilience to climate change. Start date: 01/06/2015, end date: 31/05/2018, leading by the National Center of Scientific Research Demokritos (Greece).
Participation of Hellenic National Meteorological Service – HNMS as partner in NFOFRAS – National Forest Fire Risk Assessment System Phase A', a si-cluster collaborated project (in the framework of Hellenic Space Technologies and Applications), leading by ''ATHENA'' Research and Innovation Center, in Information, Communication and Knowledge Technologies, 2014-2015.