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

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

COMECA 2016 covers various topics related to the Atmospheric Sciences, which is in fact an interdisciplinary field, providing the opportunity to understand the physical notions of Meteorology, Climatology, and Atmospheric Physics in an integrated manner. The papers presented at the COMECAP 2016 cover a broad spectrum of topics that include Atmospheric Numerical Modeling, Synoptic and Dynamic Meteorology, Applied Meteorology and Climatology, Remote Sensing, Satellite Meteorology, Agricultural Meteorology and Climatology, Weather Analysis and Forecasting, Extreme Weather Events, Weather Modification, Aerosols, Stratospheric Ozone, Air Pollution and Air Quality, Atmospheric Radiation, Atmospheric Chemistry, Climate Dynamics, and Climatic Changes.
A total of 179 full papers are finally accepted for publication at the conference proceedings after peer review conducted, mainly by the members of the scientific committee. The published papers in this two-volume book are grouped into three main sections, as reflected in the title of the conference: 61 papers in Meteorology, 48 in Climatology, and 70 in Atmospheric Physics.

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

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