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KEY=STRATOSPHERE - LAM POWELL

Stratosphere Troposphere Interactions

An Introduction

Springer Science & Business Media Stratospheric processes play a signi?cant role in regulating the weather and c- mate of the Earth system. Solar radiation, which is the primary source of energy for the tropospheric weather systems, is absorbed by ozone when it passes through the stratosphere, thereby modulating the solar-forcing energy reaching into the t- posphere. The concentrations of the radiatively sensitive greenhouse gases present in the lower atmosphere, such as water vapor, carbon dioxide, and ozone, control the radiation balance of the atmosphere by the two-way interaction between the stratosphere and troposphere. The stratosphere is the transition region which interacts with the weather s- tems in the lower atmosphere and the richly ionized upper atmosphere. Therefore, this part of the atmosphere provides a long list of challenging scienti?c problems of basic nature involving its thermal structure, energetics, composition, dynamics, chemistry, and modeling. The lower stratosphere is very much linked dynamically, radiatively,and chemically with the upper troposphere,even though the temperature characteristics of these regions are different. The stratosphere is a region of high stability, rich in ozone and poor in water - por and temperature increases with altitude. The lower stratospheric ozone absorbs the harmful ultraviolet (UV) radiation from the sun and protects life on the Earth. On the other hand, the troposphere has high concentrations of water vapor, is low in ozone, and temperature decreases with altitude. The convective activity is more in the troposphere than in the stratosphere.

Ozone in the Troposphere and Stratosphere, Part 1

Tropospheric Ozone

Regional and Global Scale Interactions

Springer Science & Business Media The main objective of the workshop was to increase our knowledge of ozone formation and distribution in the troposphere, its relation to precursor (NO~ and HC species) distribution, how it is affected by transport processes in the troposphere, and to show how the increasing levels of ozone can cause environmental problem. The focus was on the interaction of ozone on regional and global scales. There is mounting evidence that such interactions occur and that the ozone levels are increasing in most of the Northern Hemisphere tropo sphere. A likely source of ozone increase is human activity. As result of this, tropospheric climate may change significantly within a few decades, either through direct effects by ozone itself or indirectly through its effect on other radiatively active trace species. Further more, ozone may have adverse effects on vegetation over large continental areas due to enhanced levels which have been measured to take place. As it is well known that ozone plays a key role in the oxidation of a large number of chemical species in the troposphere, natural as well as man-made, the atmospheric distribution of important trace species like sulfur dioxide, nitrogen oxides and hydrocarbons could be markedly changed as a result of ozone changes. The rapidly increasing interest in tropospheric ozone, and the key role ozone plays in several atmospheric areas as well the obvious increase in the tropospheric concentration of ozone made ozone a natural choice as a topic for the workshop.

Ozone in the Troposphere and Stratosphere

Proceedings of the Quadrennial Ozone Symposium 1992 : Held in Charlottesville, Virginia, June 4-13, 1992

Abstract: The papers presented at the 1992 Quadrennial Ozone Symposium held in Charlottesville, Virginia, cover topics in both tropospheric and stratospheric research. These topics include ozone trends and climatology, ground based, aircraft, balloon, rocket and satellite measurements, artic and antartic research, global and regional modeling, and volcanic effects.

Extremes in Atmospheric Processes and Phenomenon: Assessment, Impacts and Mitigation

Springer Nature

Fundamentals of Environmental and Toxicological Chemistry

Sustainable Science, Fourth Edition

CRC Press Fundamentals of Environmental and Toxicological Chemistry: Sustainable Science, Fourth Edition covers university-level environmental chemistry, with toxicological chemistry integrated throughout the book. This new edition of a bestseller provides an updated text with an increased emphasis on sustainability and green chemistry. It is organized based on the five spheres of Earth’s environment: (1) the hydrosphere (water), (2) the atmosphere (air), (3) the geosphere (solid Earth), (4) the biosphere (life), and (5) the anthrosphere (the part of the environment made and used by humans). The first chapter defines environmental chemistry and each of the five environmental spheres. The second chapter presents the basics of toxicological chemistry and its relationship to environmental chemistry. Subsequent chapters are grouped by sphere, beginning with the hydrosphere and its environmental chemistry, water pollution, sustainability, and water as nature’s most renewable resource. Chapters then describe the atmosphere, its structure and importance for protecting life on Earth, air pollutants, and the sustainability of atmospheric quality. The author explains the nature of the geosphere and discusses soil for growing food as well as geosphere sustainability. He also describes the biosphere and its sustainability. The final sphere described is the anthrosphere. The text explains human influence on the environment, including climate, pollution in and by the anthrosphere, and means of sustaining this sphere. It also discusses renewable, nonpolluting energy and introduces workplace monitoring. For readers needing additional basic chemistry background, the book includes two chapters on general chemistry and organic chemistry. This updated edition includes three new chapters, new examples and figures, and many new homework problems.

Air Pollution XXII

WIT Press The proceedings of the 22nd International Conference on Modelling, Monitoring and Management of Air Pollution, builds upon the prestigious outcomes of the 21 preceding meetings beginning in 1993. Air pollution is one of the most challenging problems facing the international community; it is widespread and growing in importance, and has clear and known impacts on health and the environment. The human need for transport, manufactured goods and services results in impacts on the atmospheric environment from a local to global scale. The rate of development of the global economy brings new pressures and the willingness of governments to regulate air pollution is often balanced by concerns over the economic impact of such regulation. Science is the key to identifying the nature and scale of air pollution impacts and is essential in the formulation of policies for regulatory decision-making. Continuous improvements to our knowledge of the fundamental science of air pollution and its application are necessary if we are to predict, assess and mitigate the air pollution implications to local, regional, national and international systems. Topics covered include: Air pollution modelling; Air pollution mitigation; Air pollution management; Aerosols and particles; Emission studies; Exposure and health effects; Indoor air pollution; Monitoring and measuring; Case studies; Emerging technologies; Power generation and air pollution; Incineration plant studies; Air pollution chemistry; Global and regional studies; Policy and legislation.

Earth System Science

From Biogeochemical Cycles to Global Changes

Academic Press Over the last decade, the study of cycles as a model for the earth's changing climate has become a new science. Earth Systems Science is the basis for understanding all aspects of anthropogenic global change, such as chemically forced global climate change. The work is aimed at those students interested in the emerging scientific discipline. Earth Systems Science is an integrated discipline that has been rapidly developing over the last two decades. New information is included in this updated edition so that the text remains relevant. This volume contains five new chapters, but of special importance is the inclusion of an expanded set of student exercises. The two senior authors are leading scientists in their fields and have been awarded numerous prizes for their research efforts. * First edition was widely adopted * Authors are highly respected in their field * Global climate change, integral to the

book, is now one of the most important issues in atmospheric sciences and oceanography

Introduction to Atmospheric Chemistry

Cambridge University Press Introduction to Atmospheric Chemistry is a concise, clear review of the fundamental aspects of atmospheric chemistry. In ten succinct chapters, it reviews our basic understanding of the chemistry of the Earth's atmosphere and discusses current environmental issues, including air pollution, acid rain, the ozone hole, and global change. Written by a well-known atmospheric science teacher, researcher, and author of several established textbooks, this book is an introductory textbook for beginning university courses in atmospheric chemistry. Also suitable for self instruction, numerous exercises and solutions make this textbook accessible to students covering atmospheric chemistry as a part of courses in atmospheric science, meteorology, environmental science, geophysics and chemistry. Together with its companion volume, Basic Physical Chemistry for the Atmospheric Sciences (second edition 2000; Cambridge University Press), Introduction to Atmospheric Chemistry provides a solid introduction to atmospheric chemistry.

Book Catalog of the Library and Information Services Division: Shelf List catalog

Issues in Aerospace and Defense Research and Application: 2013 Edition

ScholarlyEditions Issues in Aerospace and Defense Research and Application: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Aerospace Research. The editors have built Issues in Aerospace and Defense Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Aerospace Research in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Aerospace and Defense Research and Application: 2013 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Meteorological and Geoastrophysical Abstracts

Book catalog of the Library and Information Services Division

Nuclear Science Abstracts

NSA is a comprehensive collection of international nuclear science and technology literature for the period 1948 through 1976, pre-dating the prestigious INIS database, which began in 1970. NSA existed as a printed product (Volumes 1-33) initially, created by DOE's predecessor, the U.S. Atomic Energy Commission (AEC). NSA includes citations to scientific and technical reports from the AEC, the U.S. Energy Research and Development Administration and its contractors, plus other agencies and international organizations, universities, and industrial and research organizations. References to books, conference proceedings, papers, patents, dissertations, engineering drawings, and journal articles from worldwide sources are also included. Abstracts and full text are provided if available.

Izvestiya

Atmospheric and oceanic physics

Stratospheric Ozone Reduction, Solar Ultraviolet Radiation and Plant Life

Springer Science & Business Media Inadvertent alterations of the earth's atmosphere by man's activities are now of regional and even global proportion. Increasing concern has been focused in the last decade on consequences of acid rain, carbon dioxide enrichment of the atmosphere and reduction of ozone in the upper atmosphere. The latter two problems are of truly global scale. This book focuses on the atmospheric ozone reduction problem and the potential consequences for plant life. unlike carbon dioxide enrichment, reduction of the total atmospheric ozone column has not yet taken place to a noticeable degree -- it is a problem of the future. The

processes leading to ozone reduction involve time periods on the scale of decades. However, by the same token, if society finds ozone reduction to be unacceptable it will take even longer for the process to be reversed. Thus, anticipation of the consequences of ozone reduction is of obvious importance. Speculation of the possibility of ozone reduction first appeared in the early 1970's and was focused on the consequences of the injection of large quantities of nitrogen oxides into the upper atmosphere by supersonic aircraft flying at high altitudes. Other sources of nitrogen oxides originating from the earth's surface were also considered. With further refinement, the concerns of nitrogen oxide pollution of the upper atmosphere were diminished since the quantities likely to be involved were insufficient to cause a serious threat to the ozone layer.

World Resources 1988-1989

Basic Books Chapters cover population and health; human settlements; food and agriculture; forests and rangelands; wildlife and habitat; energy; freshwater, oceans and coasts; atmosphere and climate; global systems and cycles; policies and institutions. Annotation copyrighted by Book News, Inc., Portland, OR

IUTAM Symposium on Advances in Mathematical Modelling of Atmosphere and Ocean Dynamics

Proceedings of the IUTAM Symposium held in Limerick, Ireland, 2–7 July 2000

Springer Science & Business Media The goals ofthe Symposium were to highlight advances in modelling ofatmosphere and ocean dynamics, to provide a forum where atmosphere and ocean scientists could present their latest research results and learn ofprogress and promising ideas in these allied disciplines; to facilitate interaction between theory and applications in atmosphere/ocean dynamics. These goals were seen to be especially important in view ofcurrent efforts to model climate requiring models which include interaction between atmosphere, ocean and land influences. Participants were delighted with the diversity ofthe scientific programme; the opportunity to meet fellow scientists from the other discipline (either atmosphere or ocean) with whom they do not normally interact through their own discipline; the opportunity to meet scientists from many countries other than their own; the opportunity to hear significant presentations (50 minutes) from the keynote speakers on a range ofrelevant topics. Certainly the goal ofcreating a forum for exchange between atmosphere and ocean scientists who need to input to create realistic models for climate prediction was achieved by the Symposium and this goal will hopefully be further advanced by the publication ofthese Proceedings.

Trace Gas Emissions by Plants

Academic Press Many trace gases are exchanged between the atmosphere and the biosphere. Although much research has been published on the photosynthetic exchanges of carbon dioxide, oxygen, and water vapor, this book focuses on the importance of biogenic trace gases on atmosphere chemistry and ecosystem stability. Included are methane and its effect on the radiative properties of the atmosphere, hydrocarbons (isoprene and monoterpenes), and their role in the production of ozone and carbon monoxide. Also covered are sulfur and nitrogen gases, both of which can lead to ecosystem acidification. The biochemistry and physiology of production of these and other gases are investigated. Plant physiologists, ecologists, and atmospheric chemists and modelers will benefit from this book.

Trace Gas Emissions and Plants

Springer Science & Business Media Atmospheric abudance of trace gases since the pre-industrial time has forced the earth's climate to change, threatening food security. Exchange of biogenic trace gases between the atmosphere and the biosphere is directly or indirectly influenced by the plants. This volume contains the latest findings on the correlation between the climate change and biogenic gas emission, plant response to elevated levels of carbon dioxide, temperature, ozone and UV-B in combination and alone, regulatory mechanism of methane, nitrous oxide and ammonia emission and their mitigating options. Ecologists, atmospheric scientists, plant physiologists, research scholars, teachers and post-graduate students will benefit from this book.

Atmospheric Methane: Sources, Sinks, and Role in Global Change

Springer Science & Business Media Methane plays many important roles in the earth's environment. It is a potent "greenhouse gas" that warms the earth; controls the oxidizing capacity of the atmosphere (OH) indirectly affecting the cycles and abundances of many atmospheric trace gases; provides water vapor to the stratosphere; scavenges chlorine atoms from the stratosphere, terminating the catalytic ozone destruction by chlorine atoms, including the chlorine released from the man-made chlorofluorocarbons; produces ozone, CO, and CO2 in the troposphere; and it is an index of life on earth and so is present in greater quantities during warm interglacial epochs and dwindles to low levels during the cold of ice ages. By all measures, methane is the second only to CO2 in causing future global warming. The book presents a comprehensive account of the current understanding of atmospheric methane, and it is an end point for summarizing more than a decade of intensive research on the global sources, sinks, concentrations, and

environmental role of methane.

Encyclopedia of Environmental Change Three Volume Set

SAGE Accessibly written by a team of international authors, the Encyclopedia of Environmental Change provides a gateway to the complex facts, concepts, techniques, methodology and philosophy of environmental change. This three-volume set illustrates and examines topics within this dynamic and rapidly changing interdisciplinary field. The encyclopedia includes all of the following aspects of environmental change: Diverse evidence of environmental change, including climate change and changes on land and in the oceans Underlying natural and anthropogenic causes and mechanisms Wide-ranging local, regional and global impacts from the polar regions to the tropics Responses of geo-ecosystems and human-environmental systems in the face of past, present and future environmental change Approaches, methodologies and techniques used for reconstructing, dating, monitoring, modelling, projecting and predicting change Social, economic and political dimensions of environmental issues, environmental conservation and management and environmental policy Over 4,000 entries explore the following key themes and more: Conservation Demographic change Environmental management Environmental policy Environmental security Food security Glaciation Green Revolution Human impact on environment Industrialization Landuse change Military impacts on environment Mining and mining impacts Nuclear energy Pollution Renewable resources Solar energy Sustainability Tourism Trade Water resources Water security Wildlife conservation The comprehensive coverage of terminology includes layers of entries ranging from one-line definitions to short essays, making this an invaluable companion for any student of physical geography, environmental geography or environmental sciences.

International Conference on Radar Meteorology

Rethinking the Ozone Problem in Urban and Regional Air Pollution

National Academies Press Despite more than 20 years of regulatory efforts, concern is widespread that ozone pollution in the lower atmosphere, or troposphere, threatens the health of humans, animals, and vegetation. This book discusses how scientific information can be used to develop more effective regulations to control ozone. Rethinking the Ozone Problem in Urban and Regional Air Pollution discusses: The latest data and analysis on how tropospheric ozone is formed. How well our measurement techniques are functioning. Deficiencies in efforts to date to control the problem. Approaches to reducing ozone precursor emissions that hold the most promise. What additional research is needed. With a wealth of technical information, the book discusses atmospheric chemistry, the role of oxides of nitrogen (NOx) and volatile organic compounds (VOCs) in ozone formation, monitoring and modeling the formation and transport processes, and the potential contribution of alternative fuels to solving the tropospheric ozone problem. The committee discusses criteria for designing more effective ozone control efforts. Because of its direct bearing on decisions to be made under the Clean Air Act, this book should be of great interest to environmental advocates, industry, and the regulatory community as well as scientists, faculty, and students.

Tropospheric and Ionospheric Effects on Global Navigation Satellite Systems

John Wiley & Sons Tropospheric and Ionospheric Effects on Global Navigation Satellite Systems Explore atmospheric effects on radio frequency propagation in the context of Global Navigation Satellite System communication In Tropospheric and Ionospheric Effects on Global Navigation Satellite Systems, a team of distinguished researchers deliver an accessible and authoritative introduction to all scientifically relevant effects caused by the ionosphere and troposphere on GNSS RF signals. The book explores the origin of each type of propagation effect and explains it from a fundamental physical perspective. Each of the major methods used for the measurement, prediction, and mitigation of ionospheric and tropospheric effects on GNSS are discussed in detail. The authors also provide the mechanisms that drive ionization and plasma transport in the ionosphere, propagation phenomena (including scattering, absorption, and scintillations), and the predominant predictive models used to predict ionospheric propagation effects. With an emphasis on global navigation satellite systems, the book discusses the US Standard Atmosphere, a general reference model for characteristics of the unionized atmosphere. It also considers: Thorough introductions to the Global Positioning System and the principles of GNSS positioning Comprehensive explorations of tropospheric propagation and predictive models of the troposphere Practical discussions of the physics of the ionosphere, experimental observation of the ionosphere, and ionospheric propagation In-depth examinations of predictive models of the ionosphere, including group delay models for single-frequency GNSS receivers Ideal for engineers and research scientists with a professional or personal interest in geophysics, RF propagation, and GNSS and GPS applications, Tropospheric and Ionospheric Effects on Global Navigation Satellite Systems will also earn a place in the libraries of undergraduate and graduate students studying RF propagation or GNSS.

NASA Reference Publication

Carbon Cycles and Climate

A Selected Bibliography

This partially annotated bibliography contains the first 1000 references from a computerized file of literature on the global ecological implications of carbon cycles and climatic changes. Many early citations originated from the Biogeochemical Ecological Information Center established at Oak Ridge National Laboratory in 1968 and from profiles of computerized files such as Government Research Abstracts (GRA) and Biological Abstracts (BA). Later citations have been extracted from the open literature through 1978 and early 1979, from government reports and impact statements, and from profiles of GRA, BA, and the Energy Data Base of the Department of Energy Technical Information Center, Oak Ridge, Tennessee. The subject categories covered by this bibliography may be divided into two main topics: carbon cycling and climate system analysis. Volume I contains an introduction and overview. Volume 2 contains an alphabetical (by author) listing of citations. Volume 3 provides indexes for author, organization (corporate authority), keywords (or free index terms), taxonomic category, subject category, Chemical Abstracts codes, Biological Abstracts codes (crosscode), and COSATI/Weekly Government Abstracts codes concentrated with permuted title words.

Stratospheric Ozone Depletion

Hearings Before the Subcommittee on the Upper Atmosphere of the Committee on Aeronautical and Space Sciences, United States Senate, Ninety-fourth Congress, First Session ....

Satellite Remote Sensing of the Oceanic Environment

Monthly Weather Review

Atmospheric Ozone, 1985

Assessment of Our Understanding of the Processes Controlling Its Present Distribution and Change

Fluorocarbons--impact on Health and Enviornment, Hearings Before the Subcommittee on Public Health and Enviornment of ..., 93-2, Dec. 11 and 12, 1974

Journal of the Meteorological Society of Japan

Handbook of Weather, Climate, and Water

Dynamics, Climate, Physical Meteorology, Weather Systems, and Measurements

John Wiley & Sons This comprehensive, two-volume review of the atmospheric and hydrologic sciences promises to be the definitive reference for both professionals and laypersons for years to come. Volume I addresses atmospheric dynamics, physical meteorology,

weather systems, and measurements, while Volume II contains information on the climate system, atmospheric chemistry, hydrology, and societal impacts.

Atmospheric Ozone Variability

Implications for Climate Change, Human Health and Ecosystems

Springer It is well known that the ozone layer protects the Earth and its life from the harmful ultraviolet (UV) radiation of the sun. It has also been discovered that this layer was being depleted to the extent that holes were appearing in it by several substances (such as CFCs) which have since been banned. Despite this action recent studies have shown that the ozone layer is still being depleted at a rapid rate and that holes are now beginning to appear over areas which are quite densely populated. Atmospheric Ozone Variability examines the potential problems that depletion of ozone causes in relation to climate change, human health and the ecosystem. It also examines the ways in which ozone is formed and depleted as being fundamental to the debate.

Annales Geophysicae

An Introduction to the Global Circulation of the Atmosphere

Princeton University Press This is a graduate-level textbook on the global circulation of the Earth's atmosphere—the large-scale system of winds by which energy is transported around the planet, from the tropical latitudes to the poles. Written by David Randall, one of the world’s foremost experts on the subject, it is the most comprehensive textbook on the topic. Intended for Earth science students who have completed some graduate-level coursework in atmospheric dynamics, the book will help students build on that foundation, preparing them for research in the field. The book describes the many phenomena of the circulation and explains them in terms of current ideas from fluid dynamics and thermodynamics, with frequent use of isentropic coordinates and using the methods of vector calculus. It emphasizes the key roles of water vapor and clouds, includes detailed coverage of energy flows and transformations, and pays close attention to scale interactions. The book also describes the major historical contributions of key scientists, giving a human dimension to the narrative, and it closes with a discussion of how the global circulation is evolving as the Earth’s climate changes. The most comprehensive graduate-level textbook on the subject Written by one of the world’s leading experts Connects global circulation and climate phenomena Addresses energy, moisture, and angular-momentum balance; the hydrologic cycle; and atmospheric turbulence and convection Emphasizes the energy cycle of the atmosphere; the role of moist processes; and circulation as an unpredictable, chaotic process Helps prepare students for research An online illustration package is available to professors

Scientific Assessment of Ozone Depletion 2014

Government Printing Office This document is part of the information upon which the Parties to the United Nations Montreal Protocol will base their future decisions regarding ozone-depleting substances, their alternatives, and protection of the ozone layer. It is the latest in a long series of scientific assessments that have informed the Parties and contains the policy-relevant major findings of the Assessment's five scientific chapters. Actions taken under the Montreal Protocol have led to decreases in the atmospheric abundance of controlled ozone-depleting substances (ODSs), and are enabling the return of the ozone layer toward 1980 levels. This comprehensive volume includes many tables, figures, and charts throughout; and the appendices include acronyms and abbreviations, listings of authors, contributors, and reviewers from around the world, and chemical formulas. Related products: NASA and the Environment: The Case of Ozone Depletion is available here: https://bookstore.gpo.gov/products/nasa-and-environment-case-ozone-depletion Code of Federal Regulations, Title 40, Protection of Environment, Pt. 96-99, Revised as of July 1, 2016 can be found here: https://bookstore.gpo.gov/products/code-federal-regulations-title-40-protection-environment-pt-96-99-revised-july-1-2016 Our Changing Atmosphere: Discoveries from EOS Aura (Booklet) -reduced list price while supplies last available here: https://bookstore.gpo.gov/products/our-changing-atmosphere-discoveries-eos-aura-booklet

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