

Atmospheric Physics

[DOWNLOAD HERE](#)

1;Preface;5 2;Contents;8 3;Abbreviations;26 4;Part I Background;39 4.1;1 The Atmosphere: Vast, Shallow, and Full of Subtleties;40 4.1.1;Abstract;40 4.1.2;1.1 Introduction;40 4.1.3;1.2 The Vertical Structure of the Atmosphere;41 4.1.4;Box 1: Potential Temperature and Brunt-Visla Frequency ;44 4.1.5;1.3 The Tropopause Inversion Layer;45 4.1.6;Box 2: Vorticity and Potential Vorticity ;45 4.1.7;1.4 Atmospheric Circulation Patterns;47 4.1.8;1.5 Regional Atmospheric Circulations;51 4.1.9;References;52 4.2;2 Chemical Composition of the Atmosphere;54 4.2.1;Abstract;54 4.2.2;2.1 Introduction;54 4.2.3;Box 2.1: Measure of atmospheric composition;59 4.2.4;Box 2.2: Ozone production and destruction in the stratosphere;59 4.2.5;Box 2.3: Ozone productionOzone production and destruction in the troposphere;60 4.2.6;2.2 Recent Achievements in Understanding the Chemical Composition of the Atmosphere;61 4.2.6.1;2.2.0 2.2.1 Advances in Understanding the Composition of the Polar Stratosphere and Troposphere;61 4.2.6.2;2.2.0 2.2.2 Advances in Understanding the Composition at Mid-Latitudes;65 4.2.6.3;2.2.0 2.2.3 Advances in the Understanding of the Composition in the Tropics;67 4.2.7;2.3 Outlook;69 4.2.8;References;70 4.3;3 Aerosols in the Atmosphere;73 4.3.1;Abstract;73 4.3.2;3.1 Introduction;73 4.3.3;3.2 Definitions and Properties;75 4.3.4;3.3 Sources, Atmospheric Processing, and Sinks;78 4.3.5;3.4 Spatial Distribution of Aerosols;80 4.3.6;3.5 Atmospheric Lifetime and Long-Range Transport;82 4.3.7;3.6 Aerosols in the Climate System;84 4.3.8;References;87 4.4;4 Earth s Radiation Budget: The Driver for Weather and Climate;90 4.4.1;Abstract;90 4.4.2;4.1 A Few Physical Basics;90 4.4.3;4.2 The Sun and Solar Radiation Reaching Earth;92 4.4.4;4.3 Earth s Radiation Budget in Equilibrium;93 4.4.5;4.4 Imbalances in Earth s Radiation Budget;96 4.4.6;4.5 Relevance of Satellites for Monitoring the Earth Radiation Budget;98 4.4.7;4.6 Ongoing Research;100 4.5;5 Light Scattering on Molecules in the Atmosphere;103 4.5.1;Abstract;103 4.5.2;5.1 Introduction;103 4.5.3;5.2 Classification of Light Scattering Mechanisms in Molecular Gases;104 4.5.3.1;5.2.1 Rayleigh Scattering;105 4.5.3.2;5.2.2 Raman Scattering;107 4.5.3.3;5.2.3 Rayleigh--Brillouin Scattering;109 4.5.4;5.3 The Different Spectral Components of Molecular Scattered Light and Its Application in Atmospheric Science;113 4.5.5;References;116 4.6;6 Greenhouse Effect, Radiative Forcing and Climate Sensitivity;118

4.6.1;Abstract;118 4.6.2;6.1 The Greenhouse Effect as Part of Earth's Radiation Balance;119 4.6.3;6.2 Climate Variability and Anthropogenic Climate Change;121 4.6.4;6.3 Component Effects, Radiative Forcing of Climate Change, and Climate Feedbacks;122 4.6.5;6.4 Assessing Tradeoffs; Climate Sensitivity and Efficacy;126 4.6.6;6.5 Methodology Prospects of an Improved Quantification of Component Effects;128 4.6.7;6.6 Concluding Remarks and Outlook;131 4.6.8;References;132 4.7;7 Thunderstorms: Thermodynamics and Organization;134 4.7.1;Abstract;134 4.7.2;7.1 Introduction;134 4.7.3;7.2 Thermodynamics;136 4.7.4;7.3 Storm Organization;140 4.7.4.1;7.3.1 Single Cell Storms;140 4.7.4.2;7.3.2 Multicell Storms;142 4.7.4.3;7.3.3 Supercell Storms;144 4.7.5;7.4 Tornadoes and Other Severe Winds;145 4.7.6;References;147 4.8;8 Thunderstorms: Trace Species Generators;148 4.8.1;Abstract;148 4.8.2;8.1 Introduction;148 4.8.3;8.2 Experimental Set-Up of Airborne DLR Thunderstorm Field Experiments Focusing on LNO_x;150 4.8.3.1;8.2.1 Investigated Thunderstorm Types;151 4.8.3.2;8.2.2 Airborne In Situ Trace Gas Measurements;151 4.8.3.3;8.2.3 Ground-Based Lightning Measurements;152 4.8.3.4;8.2.4 Flight Planning Tools and Flight Patterns;152 4.8.3.5;8.2.5 Quantification of LNO_x;153 4.8.4;8.3 Results From Airborne DLR Thunderstorm Field Experiments Focusing on LNO_x;153 4.8.4.1;8.3.1 LNO_x Mixing Ratios in Fresh Anvils Over Europe and NO_x Contribution From th EAN/ISBN : 9783642301834 Publisher(s): Springer, Berlin Format: ePUB/PDF Author(s): Schumann, Ulrich

[DOWNLOAD HERE](#)

Similar manuals:

[Atmospheric Physics](#)

[Fundamentals Of Atmospheric Physics, Volume 61](#)