

1. Record Nr.	UNINA9910807350303321
Titolo	Modeling the ionosphere-thermosphere system / / Joseph Huba, Robert Schunk, George Khazanov, editors
Pubbl/distr/stampa	Washington, District of Columbia : , : American Geophysical Union, , 2014 ©2014
ISBN	1-118-70445-2 1-118-70441-X 1-118-70421-5
Descrizione fisica	1 online resource (350 p.)
Collana	Geophysical Monograph Series, , 0065-8448 ; ; 201
Disciplina	551.51
Soggetti	Ionosphere - Mathematical models Thermosphere - Mathematical models Atmospheric thermodynamics Dynamic meteorology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Modeling the Ionosphere- Thermosphere System; Copyright; Contents; Preface; Introduction; Section I: Physical Processes; Ionosphere- Thermosphere Physics: Current Status and Problems; 1.INTRODUCTION; 2.MISSING PHYSICS IN GLOBAL PHYSICS-BASED IONOSPHERE-THERMOSPHERE MODELS; 3.SUMMARY; REFERENCES; Physical Characteristics and Modeling of Earth's Thermosphere; 1. INTRODUCTION; 2.THE GAS LAW AND HYDROSTATIC BALANCE; 3. CONTINUITY EQUATION; 4. LAGRANGIAN VERSUS EULERIAN FRAMES OF REFERENCE; 5. HORIZONTALLY STRATIFIED FLUID AND OTHER COMMON ASSUMPTION; 6. CORIOLIS EFFECT; 7. VISCOUS DRAG; 8. ION DRAG 9. MOMENTUM EQUATION 10. ENERGY EQUATIONS; 11. NEUTRAL COMPOSITION; 12. GLOBAL WIND, TEMPERATURE, DENSITY,AND COMPOSITION STRUCTURE; 13. THERMAL EXPANSION; 14. NEUTRAL COMPOSITION BULGE; 15. WINDS AND NON-LINEARITIES AT HIGH LATITUDE; 16. CONCLUSIONS; REFERENCES; Solar Cycle Changes in the Photochemistry of the Ionosphere and Thermosphere; 1.

INTRODUCTION; 2. RESULTS; 3. CONCLUSIONS; REFERENCES; Energetics and Composition in the Thermosphere; 1. INTRODUCTION; 2. DATA AND MODELS THAT HAVE INCREASED OUR UNDERSTANDING OF; 3. THE CONTINUITY EQUATION, THE ENERGY EQUATION, AND BOUNDARY CONDITIONS
 4. THE CAUSES OF TEMPERATURE VARIATIONS IN THE LOW AND MIDDLE LATITUDES OF THE UPPER THERMOSPHERE DURING GEOMAGNETIC STORMS 5. SUMMARY; REFERENCES; Section II: Numerical Methods; Numerical Methods in Modeling the Ionosphere; 1. INTRODUCTION; 2. GENERAL EQUATIONS; 3. FIELD-ALIGNED DYNAMICS; 4. CROSS-FIELD DYNAMICS; 5. SUMMARY; REFERENCES; Ionospheric Electrodynamics Modeling; 1. INTRODUCTION; 2. EQUATIONS OF IONOSPHERIC ELECTRODYNAMICS; 3. MODELING IONOSPHERE MAGNETOSPHERE COUPLING; 4. MODELING IONOSPHERIC CONDUCTIVITIES; 5. MODELING THERMOSPHERIC WINDS; 6. PLASMA GRAVITY AND PRESSURE GRADIENT CURRENTS
 6. PLASMA GRAVITY AND PRESSURE GRADIENT CURRENTS 7. SOLVING FOR THE ELECTRIC POTENTIAL; 8. IONOSPHERIC CURRENT SYSTEM AND GEOMAGNETIC PERTURBATIONS; 9. FUTURE DIRECTIONS; REFERENCES; Section III: IT Models; The NCAR TIE-GCM: A Community Model of the Coupled Thermosphere/Ionosphere System; 1. INTRODUCTION; 2. MODEL DEVELOPMENT HISTORY; 3. MODEL DESCRIPTION; 4. SOME MODEL VALIDATION EXAMPLES; 5. FUTURE IMPROVEMENT AND DEVELOPMENT PLANS; REFERENCES; The Global Ionosphere-Thermosphere Model and the Nonhydrostatic Processes; 1. INTRODUCTION; 2. GLOBAL IONOSPHERE-THERMOSPHERE MODEL 3. NONHYDROSTATIC PROCESSES 4. CONCLUSION AND DISCUSSION; APPENDIX A: EQUATIONS IN GITM MODEL; REFERENCES; Traveling Atmospheric Disturbance and Gravity Wave Coupling in the Thermosphere; 1. INTRODUCTION; 2. GLOBAL THERMOSPHERE-IONOSPHERE MODEL; 3. SIMULATION SETUP; 4. SIMULATION RESULTS; 5. SUMMARY; REFERENCES; Air Force Low-Latitude Ionospheric Model in Support of the C/NOFS Mission; 1. INTRODUCTION; 2. MODEL DESCRIPTION AND OUTPUT; 3. A STATISTICAL STUDY OF LOW-LATITUDE IONOSPHERIC DENSITIES; 4. SUMMARY AND DISCUSSION; REFERENCES; Long-Term Simulations of the Ionosphere Using SAMI3
 1. INTRODUCTION

Sommario/riassunto

Published by the American Geophysical Union as part of the Geophysical Monograph Series, Volume 201. Modeling the Ionosphere-Thermosphere System brings together for the first time a detailed description of the physics of the IT system in conjunction with numerical techniques to solve the complex system of equations that describe the system, as well as issues of current interest. Volume highlights include discussions of: Physics of the ionosphere and thermosphere IT system, and the numerical methods to solve the basic equations of the IT system The physics and