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| 1. Record Nr.           | UNISALENT0991000603859707536   |
| Autore                  | Hynes, Samuel Lynn   |
| Titolo                  | William Golding / by Samuel Hynes  |
| Pubbl/distr/stampa      | New York : Columbia university press, 1964   |
| Descrizione fisica      | 48 p. ; 21 cm.   |
| Collana                 | Columbia essays on modern writers ; 2  |
| Disciplina              | 823.91   |
| Soggetti                | Golding, William   |
| Lingua di pubblicazione | Inglese  |
| Formato                 | Materiale a stampa   |
| Livello bibliografico   | Monografia   |
| 2. Record Nr.           | UNINA9910830011003321  |
| Titolo                  | Space physics and aeronomy collection : Ionosphere dynamics and applications / / edited by Chao Huang [and three others]                           |
| Pubbl/distr/stampa      | Hoboken, New Jersey ; ; Washington, District of Columbia : , : John Wiley & Sons, Incorporated : , : American Geophysical Union, , [2021]<br>©2021 |
| ISBN                    | 1-119-81554-1<br>1-119-81561-4<br>1-119-81553-3  |
| Descrizione fisica      | 1 online resource (574 pages)  |
| Collana                 | Geophysical Monograph  |
| Disciplina              | 538.767  |
| Soggetti                | Ionosphere - Research  |
| Lingua di pubblicazione | Inglese  |
| Formato                 | Materiale a stampa   |
| Livello bibliografico   | Monografia   |
| Nota di bibliografia    | Includes bibliographical references and index.   |
| Nota di contenuto       | Cover -- Title Page -- Copyright Page -- Contents -- List of Contributors -- Preface -- Part I The Polar Cap and Auroral Ionosphere                |

-- Chapter 1 Magnetospheric Energy Input to the Ionosphere -- 1.1  
INTRODUCTION -- 1.2 ENERGY ENTERING THE IONOSPHERE-  
THERMOSPHERE (IT) SYSTEM -- 1.3 GENERAL CIRCULATION MODELS  
(GCMS) OF MIT COUPLING -- 1.4 MODEL ASSESSMENT -- 1.5 JOULE  
HEATING -- 1.6 FUTURE DIRECTIONS -- 1.7 SUMMARY AND  
CONCLUSIONS -- ACKNOWLEDGMENTS -- REFERENCES -- Chapter 2  
High Latitude Ionospheric Convection -- 2.1 INTRODUCTION -- 2.2  
THE MAGNETOSPHERE-IONOSPHERE SYSTEM -- 2.3 STEADY-STATE  
MAGNETOSPHERIC/IONOSPHERIC CONVECTION -- 2.4 TIME-  
DEPENDENT CONVECTION -- 2.5 FURTHER READING --  
ACKNOWLEDGMENTS -- REFERENCES -- Chapter 3 Multiscale Dynamics  
in the High-Latitude Ionosphere -- 3.1 INTRODUCTION -- 3.2 CUSP --  
3.3 POLAR CAP -- 3.4 NIGHTSIDE AURORAL OVAL -- 3.5 CROSS-  
REGIONAL AND GLOBAL INTERACTION PROCESSES -- 3.6 SUMMARY --  
ACKNOWLEDGMENTS -- REFERENCES -- Chapter 4 Recent Advances in  
Polar Cap Density Structure Research -- 4.1 INTRODUCTION TO POLAR  
CAP DENSITY STRUCTURES -- 4.2 STATISTICAL OCCURRENCE RATE OF  
POLAR CAP PATCHES -- 4.3 PLASMA CHARACTERISTICS WITHIN THE  
POLAR CAP PATCHES -- 4.4 DYNAMIC EVOLUTION OF POLAR CAP  
PATCHES -- 4.5 ION UPFLOW ASSOCIATED WITH POLAR CAP HIGH-  
DENSITY STRUCTURES -- 4.6 OPTICAL EMISSION MECHANISMS AND  
VARIABILITY OF POLAR CAP PATCHES -- 4.7 SUMMARY AND  
CONCLUSIONS -- ACKNOWLEDGMENTS -- REFERENCES -- Chapter 5  
Polar Cap O<sup>+</sup> Ion Outflow and Its Impact on Magnetospheric Dynamics  
-- 5.1 POLAR CAP ION OUTFLOW -- 5.2 IMPACTS OF ION OUTFLOW ON  
MAGNETOSPHERIC DYNAMICS -- 5.3 OUTSTANDING QUESTIONS --  
REFERENCES -- Part II The Subauroral and Midlatitude Ionosphere --  
Chapter 6 Ionospheric Storm-Enhanced Density Plumes -- 6.1 REVIEW  
OF IONOSPHERIC OBSERVATIONS OF STORM-ENHANCED DENSITY --  
6.2 SED CHARACTERISTICS.  
6.3 SED FORMATION PROCESSES -- 6.4 SED PLASMA IN THE CUSP AND  
MAGNETOSPHERE -- 6.5 SUMMARY AND CURRENT STATUS --  
ACKNOWLEDGMENTS -- REFERENCES -- Chapter 7 Ion Outflow and  
Lobe Density: Interhemispheric Asymmetries -- 7.1 INTRODUCTION --  
7.2 ESTIMATING PLASMA DENSITY FROM SPACECRAFT POTENTIAL --  
7.3 OBSERVATIONS AND DATA SET CHARACTERISTICS -- 7.4 NORTH-  
SOUTH ASYMMETRIES -- 7.5 SUMMARY AND DISCUSSION --  
ACKNOWLEDGMENTS -- REFERENCES -- Chapter 8 Mesoscale and  
Small-Scale Structure of the Subauroral Geospace -- 8.1  
INTRODUCTION -- 8.2 TURBULENT PLASMAPAUSE BOUNDARY LAYER  
-- 8.3 IONOSPHERIC STRUCTURES -- 8.4 DISCUSSION -- 8.5  
CONCLUSION -- ACKNOWLEDGMENTS -- REFERENCES -- Part III The  
Low-Latitude Ionosphere -- Chapter 9 Equatorial Ionospheric  
Electrodynamics -- 9.1 INTRODUCTION -- 9.2 BASIC PRINCIPLES -- 9.3  
QUIET-TIME EQUATORIAL PLASMA DRIFTS -- 9.4 STORM-TIME  
EQUATORIAL ELECTRIC FIELDS -- 9.5 FUTURE DIRECTIONS --  
ACKNOWLEDGMENTS -- REFERENCES -- Chapter 10 Theory and  
Modeling of Equatorial Spread F -- 10.1 INTRODUCTION -- 10.2  
THEORY -- 10.3 MODELING -- 10.4 NEW FINDINGS -- 10.5 SUMMARY  
AND FUTURE DIRECTIONS -- ACKNOWLEDGMENTS -- REFERENCES --  
Chapter 11 Observations of Equatorial Spread F: A Working Hypothesis  
-- 11.1 INTRODUCTION -- 11.2 SOURCES, SEEDING, DRIVERS, AND  
LOADING -- 11.3 CLIMATOLOGY OF ESF -- 11.4 DAY-TO-DAY  
VARIABILITY OF ESF -- 11.5 WHAT ABOUT LOW SOLAR ACTIVITY? --  
11.6 DISCUSSION -- 11.7 OUTSTANDING QUESTIONS --  
ACKNOWLEDGMENTS -- REFERENCES -- Chapter 12 The Equatorial  
Electrojet -- 12.1 HISTORICAL OBSERVATIONS -- 12.2 MAGNETIC  
SIGNATURES AND CURRENT DENSITY PROFILES -- 12.3

ELECTRODYNAMICS DESCRIPTION AND MODELING OF THE EEJ -- 12.4  
CLIMATOLOGICAL CHARACTERISTICS OF THE EEJ -- 12.5 TIDAL  
FEATURES OF THE EEJ -- 12.6 THE COUNTER-ELECTROJET -- 12.7  
SUMMARY AND OPEN ISSUES -- ACKNOWLEDGMENTS -- REFERENCES.  
Chapter 13 Equatorial Ionization Anomaly Variations During  
Geomagnetic Storms -- 13.1 INTRODUCTION -- 13.2 MAJOR  
MECHANISMS RESPONSIBLE FOR THE EQUATORIAL IONOSPHERIC  
RESPONSE TO THE MAGNETIC STORMS -- 13.3 VARIATIONS OF THE  
IONOSPHERIC STORM EFFECTS IN THE EQUATORIAL AND LOW LATITUDE  
REGIONS -- 13.4 CHALLENGES AND UNSOLVED ISSUES --  
ACKNOWLEDGMENTS -- REFERENCES -- Part IV Global Ionospheric  
Processes -- Chapter 14 Penetration of the Magnetospheric Electric  
Fields to the Low Latitude Ionosphere -- 14.1 TECHNIQUES TO  
OBSERVE THE PENETRATION ELECTRIC FIELD -- 14.2 CONVECTION AND  
SHIELDING ELECTRIC FIELDS -- 14.3 PENETRATION OF ELECTRIC FIELDS  
DURING SUBSTORMS -- 14.4 PENETRATION OF ELECTRIC FIELDS  
DURING GEOMAGNETIC STORMS -- 14.5 TRANSMISSION MECHANISM --  
14.6 SUMMARY AND ISSUES -- ACKNOWLEDGMENTS -- REFERENCES --  
Chapter 15 Ionosphere and Thermosphere Coupling at Mid- and  
Subauroral Latitudes -- 15.1 INTRODUCTION -- 15.2 IONOSPHERIC  
RESPONSES TO THERMOSPHERIC NEUTRAL WINDS -- 15.3  
THERMOSPHERIC VARIATIONS DRIVEN BY IONOSPHERIC DYNAMICS --  
15.4 INFLUENCES FROM BELOW -- 15.5 SUMMARY --  
ACKNOWLEDGEMENTS -- REFERENCES -- Chapter 16 Sudden  
Stratospheric Warming Impacts on the Ionosphere-Thermosphere  
System: A Review of Recent Progress -- 16.1 INTRODUCTION -- 16.2  
SUDDEN STRATOSPHERIC WARMING EVENTS -- 16.3 SSW EFFECTS ON  
THE THERMOSPHERE -- 16.4 IONOSPHERIC RESPONSE -- 16.5  
NUMERICAL SIMULATIONS -- 16.6 OUTSTANDING ISSUES AND  
CONCLUDING REMARKS -- ACKNOWLEDGEMENTS -- REFERENCES --  
Chapter 17 Ionospheric Dynamics and Their Strong Longitudinal  
Dependences -- 17.1 INTRODUCTION -- 17.2 MID-LATITUDE  
IONOSPHERE STRUCTURES -- 17.3 GLOBAL EQUATORIAL IONOSPHERE  
DYNAMICS AND STRUCTURES -- 17.4 LONGITUDINAL DEPENDENCE OF  
VERTICAL DRIFT -- 17.5 Summary and Future Directions --  
ACKNOWLEDGMENTS -- REFERENCES.  
Chapter 18 Medium-Scale Traveling Ionospheric Disturbances -- 18.1  
INTRODUCTION -- 18.2 ELECTRIFIED MEDIUM-SCALE TRAVELING  
IONOSPHERIC DISTURBANCES -- 18.3 MSTIDS INDUCED BY UPWARD-  
PROPAGATING GRAVITY WAVES -- 18.4 DISCUSSION --  
ACKNOWLEDGMENTS -- REFERENCES -- Part V Ionospheric Impacts on  
Applications -- Chapter 19 IONOSPHERIC EFFECTS ON HF RADIO WAVE  
PROPAGATION -- 19.1 INTRODUCTION -- 19.2 HF PROPAGATION IN  
THE UNDISTURBED IONOSPHERE -- 19.3 EFFECTS OF IONOSPHERIC  
DISTURBANCES ON HF INSTRUMENTS -- 19.4 SPORADIC-E -- 19.5  
SUMMARY -- ACKNOWLEDGMENTS -- REFERENCES -- Chapter 20  
Ionospheric Scintillation Effects on Satellite Navigation -- 20.1  
INTRODUCTION -- 20.2 NAVIGATION SYSTEM PERFORMANCE CRITERIA  
-- 20.3 STAND-ALONE GNSS STANDARD POSITIONING SERVICE -- 20.4  
SATELLITE-BASED AUGMENTATION SYSTEMS (SBAS) -- 20.5 GROUND-  
BASED AUGMENTATION SYSTEMS (GBAS) -- 20.6 FINAL COMMENTS --  
ACKNOWLEDGMENTS -- REFERENCES -- Chapter 21 Ionospheric  
Disturbances Related to Earthquakes -- 21.1 INTRODUCTION -- 21.2  
GNSS-TEC OBSERVATIONS -- 21.3 COSEISMIC IONOSPHERIC  
DISTURBANCES -- 21.4 PRESEISMIC IONOSPHERIC ANOMALIES -- 21.5  
CONCLUDING REMARKS -- ACKNOWLEDGMENTS -- REFERENCES --  
Chapter 22 Atmospheric and Ionospheric Disturbances Caused by  
Tsunamis -- 22.1 INTRODUCTION -- 22.2 ACOUSTIC-GRAVITY WAVE

Sommario/riassunto

"The ionosphere is a layer within the atmosphere that consists of charged particles (i.e., electrons and ions) due to ionization of neutrals by solar radiation and energetic particle precipitation from the magnetosphere. The ionosphere extends from about 60 km above the Earth's surface to about 1,000 km in altitude. Ionospheric dynamics is affected by many different forcings, including solar flares, geomagnetic storms, tides and waves from the lower atmosphere, as well as disturbances triggered by earthquakes and tsunamis. The ionosphere behaves very differently under different solar and geomagnetic conditions, and its variability has direct impacts on radio communication and satellite navigation system. Our knowledge on the ionosphere has been greatly advanced in recent several decades owing to modernized instruments, much improved numerical models, and powerful computing capabilities. On the other hand, many important aspects of ionospheric dynamics are still not well understood, especially during geomagnetic storms, because of the complexity of the coupled magnetosphere-ionosphere-thermosphere system. This book provides a comprehensive overview of global ionospheric research ranging from the polar cap to the equatorial region. The book consists of five parts. Part 1 addresses magnetospheric-ionospheric coupling, magnetospheric energy input in the high-latitude ionosphere, ion outflow, and ionospheric convection in the polar cap and auroral zone. Part 2 concerns interhemispheric asymmetries, ionospheric structures such as large-scale storm enhanced density plumes, and meso- and small-scale structures in the subauroral and mid-latitude ionosphere. Part 3 focuses on the low-latitude ionosphere, including equatorial ionospheric electrodynamics, equatorial spread F, equatorial electrojet, and equatorial ionization anomaly. Part 4 covers global ionospheric processes such as penetration electric fields, magnetospheric-ionospheric coupling at middle and subauroral latitudes, sudden stratospheric warming impacts on the ionosphere, longitudinal dependence of ionospheric dynamics, and travelling ionospheric disturbances. Part 5 discusses ionospheric effects on HF wave propagation and satellite navigation, as well as ionospheric disturbances caused by earthquakes and tsunamis"--

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