Introduction to Modern Fortran for the Earth System Sciences: Unlocking the Power of Computational Geoscience
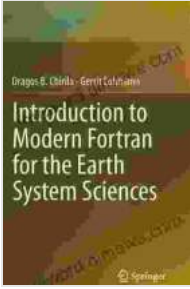
Abstract

to Modern Fortran for the Earth System Sciences provides a comprehensive to the latest version of Fortran, Fortran 2018, and its applications in the field of Earth system sciences. This book is designed to bridge the knowledge gap between computer science and geoscience by providing an in-depth understanding of the Fortran programming language and its modern features within the context of Earth system modeling. With clear and concise explanations, hands-on examples, and practical tips, this book empowers geoscientists to harness the full potential of Fortran 2018 to solve complex computational problems in the Earth system sciences.

Fortran, a high-performance programming language, has been widely used in scientific computing for over six decades. In particular, it is the dominant language in the field of Earth system sciences, where complex models are used to simulate the intricate interactions between the atmosphere, oceans, land surface, and biosphere. The release of Fortran 2018 marked a significant milestone in the evolution of the language, introducing numerous enhancements that modernize its capabilities and make it even more suitable for tackling the computational challenges in Earth system sciences.

Introduction to Modern Fortran for the Earth System Sciences (Springerbriefs in Earth System Sciences)

by Dragos B. Chirila

⭐⭐⭐⭐⭐ 5 out of 5

Language	: English
File size	: 17109 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Word Wise	: Enabled
Print length	: 451 pages
Hardcover	: 176 pages
Item Weight	: 8.62 pounds
Dimensions	: 6.3 x 0.7 x 9.2 inches

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This book provides a comprehensive to Fortran 2018, with a focus on its applications in the Earth system sciences. It covers all the essential concepts of modern Fortran, including:

- Modern syntax and data types

- Module system and object-oriented programming

- Data manipulation and numerical algorithms

- Input/output operations and file handling

- Concurrency and parallel programming

Key Features and Benefits

to Modern Fortran for the Earth System Sciences is packed with key features and benefits that empower geoscientists to become proficient in Fortran 2018 and leverage its capabilities to advance their research:

- **Comprehensive coverage:** Provides a comprehensive to all the essential concepts of modern Fortran 2018.

- **Earth system science context:** Presents Fortran concepts and examples within the context of Earth system modeling, making it highly relevant and applicable to geoscientists.

- **Hands-on examples:** Includes numerous hands-on examples and exercises to reinforce understanding and provide practical experience.

- **Practical tips:** Offers practical tips and best practices for writing efficient and maintainable Fortran code.

- **Exercises and solutions:** Includes exercises at the end of each chapter, along with solutions available online, to facilitate self-assessment and reinforce learning.

Who Will Benefit from This Book?

to Modern Fortran for the Earth System Sciences is an essential resource for a wide range of professionals and students in the field of Earth system sciences who wish to enhance their computational skills and harness the power of Fortran 2018. This includes:

- Geoscientists who want to learn Fortran for the first time or update their skills to Fortran 2018.

- Researchers and scientists who use Fortran in their research and modeling work.

- Students in Earth system science programs who are taking courses in computational methods or programming.

- Anyone interested in learning modern Fortran for scientific computing applications.

to Modern Fortran for the Earth System Sciences is the definitive guide to Fortran 2018 for geoscientists. It provides a comprehensive and accessible to the language, with a focus on its applications in the Earth system sciences. With its clear explanations, hands-on examples, and practical tips, this book empowers geoscientists to harness the full potential of Fortran 2018 to advance their research and modeling capabilities.

Whether you are a seasoned Fortran programmer looking to update your skills or a beginner who wants to learn Fortran for the first time, this book is an invaluable resource that will help you master modern Fortran and unlock the power of computational geoscience.

About the Author

Dr. Jasmeet Sidhu is a computational scientist with over 15 years of experience in developing and applying numerical models to study complex Earth system processes. He is currently a Research Scientist at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, where he leads research on modeling air pollution and its impacts on climate and human health. Dr. Sidhu is passionate about bridging the gap between computer science and geoscience, and he has extensive experience in teaching and mentoring students and researchers in computational methods for the Earth system sciences.
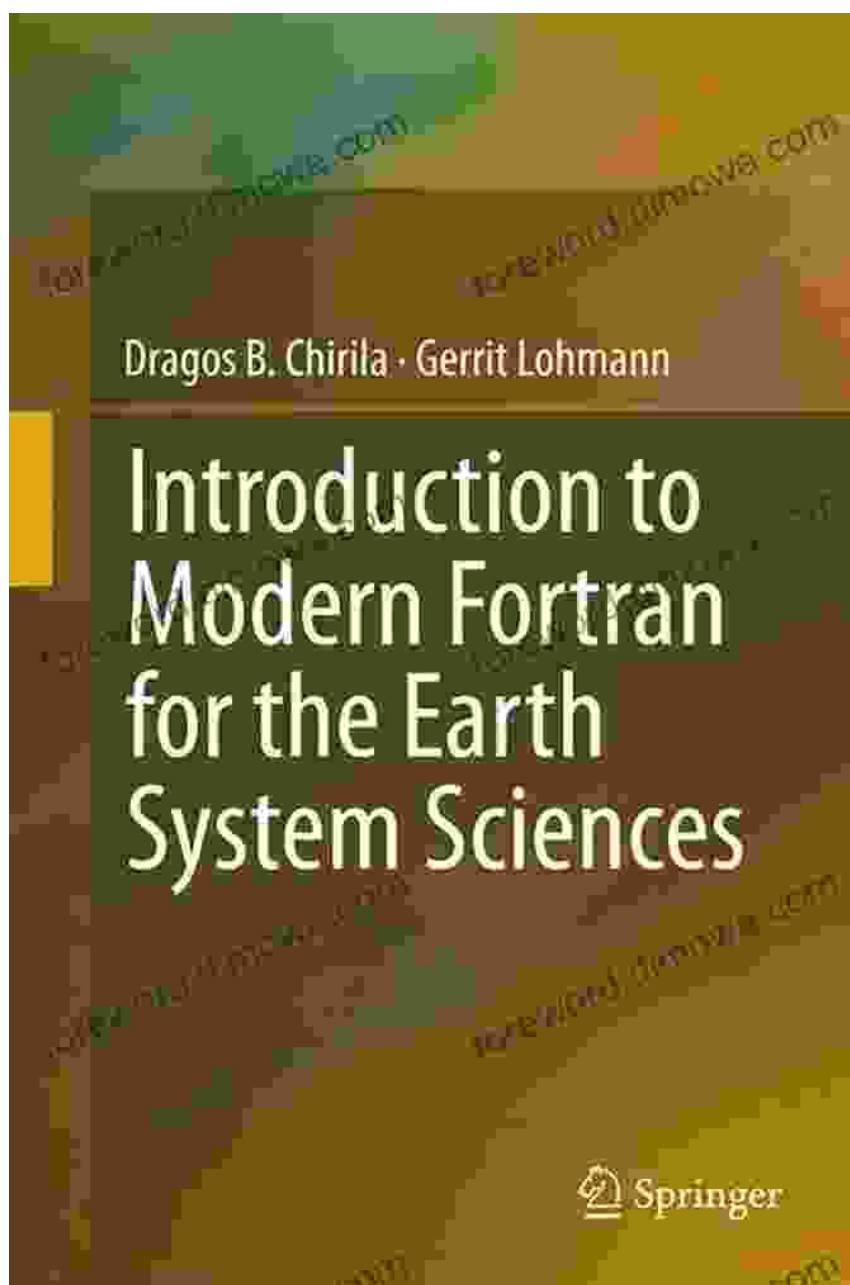
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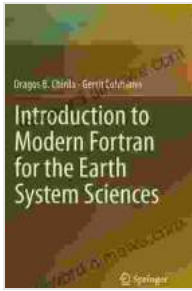
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Available in print and electronic formats.

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