

Lightning Physics and Effects

Lightning: Physics and Effects is the first book that covers essentially all aspects of lightning, including lightning physics, lightning protection, and the interaction of lightning with a variety of objects and systems as well as with the environment. It is written in a style that will be accessible to the technical non-expert and is addressed to anyone interested in lightning and its effects. This will include physicists, engineers working in the power industry and in the communications, computer, and aviation industries, meteorologists, atmospheric chemists, foresters, ecologists, physicians working in the area of electrical trauma, and architects. This comprehensive reference volume contains over 300 illustrations, 70 tables containing quantitative information, and over 6000 references and bibliography entries.

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Vladimir A. Rakov and Martin A. Uman
Frontmatter
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Lightning

Physics and Effects

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Rakov's dedication

To my wife Lucy and our son Sergei

Uman's dedication

To my wife Dorit, our children Mara,
Jon, and Derek, and our grandchildren
Sara, Hunter, Hayden, Summer, and Isabella

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Preface

In this text, the first monograph to cover essentially all aspects of lightning, every effort has been made to present a balanced review of the present knowledge of lightning physics and lightning effects. The end-of-chapter reference and bibliography lists (a total of over 6000 entries) are essentially complete on most topics up to spring 2002. The Appendix contains a list of other books on lightning and related topics. Each of the authors has contributed to all chapters of the book; however the primary authorship by chapter is as follows. Chapters 1–9 and 12 were written by Rakov; Chapters 10, 13–15, and 18–20 by Uman; and Chapters 11, 16, and 17 were jointly written. General coordination of the work resulting in this book was conducted by Rakov.

Portions of the content of this book have been used for several years as the textbook for a one-semester senior- and graduate-level course on lightning at the University of Florida. The suggested content for a similar one-semester course would include Sections 1.2, 2.5, 2.9, subsections 3.2.1–3.2.7, Chapter 4, Section 7.2, and Chapters 12 and 17. The prerequisite for such a course would be an undergraduate course in electromagnetics or an undergraduate general physics course that covered electromagnetics in moderate detail.

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